in the branch lode, which has in places given very rich values. A general sample over a width of three feet assayed over 9 ounces per ton, another over 12 inches adjacent to this gave 137 ounces, while a picked specimen ran 173 ounces. Samples taken about every foot in depth across the lode to the depth of 10 feet ran from a trace to 17 ounces, with an average of three ounces. The sample at 10 feet carried about five ounces. Other samples for a distance of 480 feet along the lode show platinum in workable quantities.

On the main lode outcrop samples of 20 inches across the lode for a distance of 50 feet gave an average of over four ounces, at three feet down over 48 inches 0.25 ounces, and at four feet down over 60 inches 1.2 ounces. Farther on a sample over three feet ran 1.35 ounces, while another sample from different parts of the trench gave 0.6 ounces. In the prospecting shaft fair values were obtained at the surface and then barren ground was struck; at 35 feet the shaft again entered ore, and at 37 feet a sample over 24 inches showed 0.35 ounces, while one adjacent to it over the same width gave only 0.5 pennyweights.

Exposures on the main lode that proved to be platiniferous represent a vertical range of 150 feet and there is no reason to believe that the character of the lode is different at considerably greater depths. The same or similar lodes occur in the neighborhood, and platinum has been found in lodes at least ten miles from the main platiniferous lode. Of course the whole region will need and is apt to receive much further investigation before it can be determined whether it will become an important platinum producer. The present conclusion of the authors of the paper is the following: "As to what dimensions production will ultimately attain, it is impossible to make any forecast. The writers do not anticipate a very large output, but, on the other hand, see no reason why, with ordinary good fortune, the company (now working the deposit) should not have a successful career."

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CORRECTION OF NET ENERGY VALUES

THE direct object of the work of the Pennsylvania Institute of Animal Nutrition has been from its inception and remains the measurement of the net energy values of feeds and the use of these values in the statement of feeding standards for farm animals.

During the life of Dr. H. P. Armsby, the former director of the institute, numerous important contributions were made to the literature of the subject above indicated, and at the time of his lamented death on October 21, 1921, an extensive accumulation of results of experiments remained in an unfinished condition. As a consequence the staff of the institute is now bringing to completion the results of seven years' animal experimentation.

As these materials are assimilated there are coming to light improvements of understanding of the general project such as place us under obligation to recompute and to correct all the net energy values which have been published from the institute. Dr. Armsby himself regarded these results as "tentative" (to use his own word), and therefore subject to revision.

The theoretical basis and the general method of work which has been followed can not be challenged; and the general order of the net energy values remains as previously reported, but the recent progress alluded to has the effect radically to alter certain values which have long been questioned, to improve very greatly the agreement of repeated estimations on the same feed and to place net energy values in general on a new plane of accuracy.

This improved situation is due mainly (1) to an improved understanding of the effects of change of position of the experimental animal on the heat outgo, and a more accurate method of computation of such effects, and (2) to a change in method of computation of net energy values which gives full and proper recognition to the fact that the energy of maintenance is a part of the net energy.

The general recognition of the net energy conception as one which promises great improvement in our understanding of the nutritive requirements of farm animals and the extensive use which is being made of net energy values seem to us to require this notice of a forthcoming revision of the published figures.

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PALAEONTOLOGISCHE GESELLSCHAFT

IN an account of recent papers by European workers on the habitat and origin of the Eurypterida (*Amer. Journ. Sci.*, March 1924), Dr. R. Ruedemann says that some of those papers were read at a "meeting of the German Paleontological Society." It should be pointed out that the society to which he refers, though it has a German name, has always been an international society. The president is an Austrian. Holland, Sweden and Great Britain are represented on the committee and the last annual meeting was in Vienna. The society has numbered distinguished American paleontologists among its members (was not Dr. Ruedemann himself one?) and hopes to attract many more. The secretary is Dr.

Fritz Drevermann, Senckenberg Museum, Frankfurt-on-Main, Germany.

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SCIENTIFIC BOOKS

Statistical Method. By TRUMAN L. KELLEY. New York, The Macmillan Company, 1924. xi + 390 pp. + 1 nomogram.

WE are living in a period of tremendous increase of interest in statistics—vital, educational, business, economic, and so on. When I was in college, only 25 years ago, it would have been difficult to find a course in statistical theory or even one in which statistical methods were widely used—perhaps least squares as a way of reducing astronomical observations and the kinetic theory of gases as a branch of the theory of heat were the only available courses. To-day an undergraduate might almost obtain a liberal education from statistical courses alone. It is natural that there should be an increasing text-book literature of statistics and of its special fields. Yule's introduction appeared in 1910, is now in its sixth edition, and remains unexcelled in its own way. We have simple books by King and Secrist directed chiefly toward the student of collegiate economics, special works on vital statistics by Whipple and Pearl for the student of public health, and an excellent general text by D. C. Jones. At the moment the latest addition is Kelley's "Statistical Method." Written by a professor of education, it is evidence of the seriousness with which such professors have come to take elaborate statistical investigations.

Kelley's book is not easy; although not primarily a mathematical treatment of its subject, a moderate use of calculus is not made the occasion for apology. The author believes that the elementary statistical needs of biologists, economists, educators and psychologists are about the same and that a book can be written to provide a common foundation for the needs of all. This is good pedagogy. If a mature investigator finds his training in some subject, such as statistics, inadequate for his needs it may be that he can fill the lacuna easiest by a special treatise in which problems in his field (and in no others) are subjected to analysis by that method; if a student of the public health must learn vital statistics it may be that a special treatment such as Whipple's or Pearl's may most easily and rapidly meet his necessities; but if the student is caught young enough he undoubtedly profits most by a general discussion of a subject with illustrations from a variety of its applications and with emphasis on the method rather than on the particular problem used as illustrative material.

The author especially requests critical analysis of his determinations of probable errors and states that he has pursued the policy that as shrewd an estimate as possible of the probable error of a statistical constant is better than no estimate at all. I desire to commend this policy; it is very important for the student of statistics to be mindful of the fact that his is not an exact science and to have constantly before him some estimate of his probable errors. And in this connection, being invited by the author to criticize, I should like to say that I do not approve of carrying numbers out to so many places as he occasionally and others habitually do. These places, when repeatedly used, give a psychological impression of exactness which has an opposing effect to that of the estimate of probable errors; any book which would be sound in practice on probable errors should give considerably more attention than Kelley's does to the matter of significant figures.

A list of titles of the chapters is the quickest way to show the scope of the book: "Tabulation and plotting of (statistical) series," "Graphic methods," "Measurement of central tendencies," "Measures of dispersion," "Normal probability distribution," "Comparable measures," "Fitting of curves to distributions," "Measures of relationship," "Functions involving correlated measures," "Further methods of measuring relationship," "Multiple correlation," "Statistical treatment of sundry special problems," "Index numbers." The method of treatment is essentially Pearsonian, small attention being given to the methods of Edgeworth and the Scandinavian School, but the author does not dismiss in a cavalier fashion the possibility and even probability that such methods may be very useful. On the whole, that shrewdness which he has shown in the estimation of probable errors pervades the whole book in its discussion and critical comment.

At times I have been doubtful about professional pedagogues and about standards of graduate study and of advanced degrees in education; it is a great encouragement to find a professor of education writing a seriously sustained book on statistical method in which the emphasis is not on an arithmetic system but on a mode of thinking.

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SPECIAL ARTICLES

A NEW FORM OF THE EXCLUSION PRINCIPLE IN OPTICAL SPECTRA

THE question which, among the numerous quantized energy-states of an atom, will "combine," by means of a transition associated with radiation, is answered by two well-known exclusion principles, according to