sary to assume from the facts reported that the drones of the F_1 generation are heterozygous as regards color. If this fact were established, it would disprove the Dzierzon theory, which is supported by so many distinct lines of evidence and thus far contradicted by none. A very direct test of the assumption that F_1 males are heterzygous could be made by mating them with queens of pure race. Such matings should produce mixed broods, if the drones are indeed heterozygous, but otherwise not.

We may conclude that the facts reported by both Newell and Quinn are credible since (1) they are really not at variance with each other, (2) they have been made independently by experienced observers in the wonderfully favorable environment of Texas and (3) their observations accord with previous knowledge. The credibility of Quinn's report is increased, not lessened, by the fact that he supposed his observations were at variance with prevalent theories.

Quinn's observations do not call in question the Mendelian inheritance of yellow body-color in crosses, but Newell reported some facts which might lead one to doubt the completeness of segregation in all cases, such as the production of drones of intermediate color. The orthodox Mendelian and the devotee of "exact" heredity will probably close his eyes to such troublesome facts, but the student of heredity who is not convinced of the finality of present knowledge might do well to keep them in view.

William E. Castle

Bussey Institution,
July 1, 1916

NOTE ON A MORAINE IN NORTHWESTERN NEW ENGLAND[1]

A recessional moraine consisting of several separate segments disposed along a sinuous course lies near the Atlantic coast, and has been traced through 60 miles from Saco, Maine, to Newbury, Mass. It stands for the most part at about or less than 100 feet above sea level, but rises to 150 feet in Dover, N. H., and Newburyport, Mass., and to between 200 and 250 feet in Wells and South Berwick, and although not more than 40 to 100 feet higher than surrounding Pleistocene formations, it is topographically prominent. The moraine rests upon and is surrounded by a floor of ice-smoothed rock and of till. During the building of the moraine the region was submerged so that the ice front stood in the sea. The moraine is the result of accumulation of glacio-fluvial detritus discharged directly into the sea; consequently in some places it is built up as broad, flat, delta-like plains. Clay ("Leda clay") which is glacial outwash was continuously deposited in the sea both while the moraine was building and also after the ice retreated from the moraine, so that the younger clay beds in some places overlie the moraine. The moraine and the marine clay probably belong to a late Wisconsin sub-stage of the Pleistocene epoch.

Further description and discussion of this moraine will appear in a paper to be published by the United States Geological Survey.

Frank J. Katz

[1] Published by permission of Director of U. S. Geological Survey.

NEPTUNIUM

In response to Professor Emerson's request for information concerning this element I beg to present the following:

Neptunium was announced by K. Hermann in 1877 (Pharm. Central H., June 7, 1877, p. 186, through the *Proceedings of the American Pharm. Assn.*, 1877, p. 268).

It is described as belonging to the "tantalum group," of the atomic weight 118, and as occurring in certain rare earths associated with tantalum and niobium.

J. F. Couch

Des Moines, Iowa

SCIENTIFIC BOOKS

Psychological Effects of Alcohol. An Experimental Investigation of the Effects of Moderate Doses of Ethyl Alcohol on a Related Group of Neuro-muscular Processes in Man. By Raymond Dodge and Francis G. Benedict, Carnegie Institution of Washington, Washington, D. C., 1915.

There is no more unsatisfactory chapter in the history of physiological psychology than that concerned with the action of alcohol. Most of the work on this subject has been done in the interests either of temperance or "beer," and shows in a striking, at times even in a grotesque, manner the failure so frequent in scientific work carried out with an immediate practical aim. It is therefore a matter for congratulation that the investigation of the physiological and psychological effects of alcohol should have been undertaken by so wholly independent a body as the Carnegie Institution and by an investigator so evidently free from practical as opposed to scientific interest as the director of its department of nutrition.

The book under notice, which is the first-fruits of this research, must be regarded as "survey" rather than "intensive" work, to borrow terms from another science. It covers an extensive field in which the action of ethyl alcohol is tested on a number of processes including the patellar and eyelid reflexes; the reaction of the eye to peripheral visual stimuli and the reaction-time in reading; the psychogalvanic reflex and the process of free association; the process of memorizing; the sensory threshold for faradaic stimulation, the velocity of eye-movements and of movements of the finger; together with observations on pulse-rate made concurrently with the other investigations.

The main result of the work is to show that wherever alcohol has an appreciable action, it is on the average depressing, and that this effect is greater on the simple motor, sensory and reflex processes than on those in which the higher parts of the nervous system are more directly involved.

The aim of the work has been to test the influence of alcohol upon a series of neuro-muscular processes. The authors have chosen for this purpose processes which they believe to be simple and customary with the avowed aim of excluding such factors as practise and interest. They hardly seem to have realized that the factors thus excluded are just those which from the title of the book we should expect to find the special object of study. The research is really one on neuro-muscular process preliminary to the study of the psychological effects of alcohol rather than such a study itself.

It is a question how far the authors have succeeded in their efforts to attain the simple. It is unfortunate, with this end in view, that they should have chosen the knee-jerk, for though this reaction is now generally regarded as a reflex, it is one of a very special kind, depending as it does upon a condition of muscular extension. Still less appropriate from this point of view are the observations which the authors have, not very happily, named after the process of reciprocal innervation and have regarded as tests of muscular coordination. It is unfortunate that in their search for the simple they should have chosen a process in which the examination of reciprocal innervation in Sherrington's sense involves a highly elaborate process of cortical activity. They have also departed widely from their principle of customary reaction for the movement of the finger which they measure is one of a highly artificial and unusual kind.

The foregoing criticisms are concerned with the general choice of the means by which neuro-muscular activity has been tested. With regard to the methods employed for this purpose the chief criticism to be offered is that the authors have depended too much on the time-relations of the processes they study and too little on their accuracy and on the adequacy with which the movements fulfil their functions. Otherwise little objection can be raised to the technique of the observations. In such survey work in which a number of subjects were employed, it was perhaps impossible to regulate their lives more completely and thus bring the research nearer to the ideal of the method of difference, but this regulation should not be neglected in more intensive work. Similarly, the disuse of control-mixtures is of little importance in work from which psychological factors have been so largely excluded, but it is to be hoped that this precedent will not be followed when psycho-

logical processes become the special object of research.

Less satisfactory than the experimental technique is the statistical treatment of the results. Serious objection must be taken to the misuse of the average. It is wholly misleading, for instance, to give 22 as the average of the three measurements, +85, −9 and −11. This figure is held to show that three so-called psychopathic subjects, *i. e.*, men who had been intemperate, did not differ to any extent from seven normal subjects. Really, the figures only show that of three formerly intemperate subjects one was far more sensitive than usual to the depressing effects of alcohol on the eyelid reflex, while the other two subjects resembled one out of the seven normal men in showing the stimulating effect of 30 c.c. of ethyl alcohol. This and other measurements on the intemperate subjects serve to confirm the statements made in their personal histories, that one was unusually sensitive to the influence of alcohol, while the others were less sensitive than usual, not, it is probable, on account of psychopathy, but through their former habituation to the action of alcohol. In so far as any weight can be attached to the apparently stimulating effect of alcohol in these two subjects, it may have been due to the satisfaction of a craving.

This work is the first contribution to an investigation of the action of alcohol which it is to be hoped may extend over many years and go far to settle a number of obscure and difficult problems. I have ventured to call attention to certain points of methodology and workmanship which seem to require reconsideration because in such an investigation principles and methods can not be too closely scrutinized at the outset. The criticisms now offered must not be allowed to obscure the recognition of the great value and promise of the work.

W. H. R. Rivers
University of Cambridge

Typical Flies—A Photographic Atlas of Diptera, including Aphaniptera. By E. K. Pearce. Cambridge (England), University Press, 1915.

This royal octavo, bound in boards, contains 4 pages of preface, 4 pages of classification; 45 pages of half-tone reproductions from photographs, comprising 155 figures representing 125 species distributed in various families, including 4 species of fleas, and 3 fly habitats; concluding with 2 pages of index. Under the figures are given technical name of the species, common name, if any, length of body, wing expanse, with brief data on habits and habitats.

The book is intended to fill the place of a pictorial elementary treatise. The plan is an excellent one, but difficult of proper execution. The author complains of the difficulties which he encountered in obtaining suitable material for photographic reproduction. Nevertheless, the figures are all quite recognizable, which is the main requisite to the success of the plan. The feature of including habitat photographs is commendable and might have been farther pursued.

There is no doubt that the wings and legs of flies must be spread in order to photograph them to the best advantage, but care must be exercised to secure natural attitudes, just as in the mounting of birds, mammals and other animals. Otherwise the reproductions are not true to nature but leave a marred image upon the memory, which appreciably reduces facility of recognition of the species in its habitat.

Recommendations made by the author in his preface regarding methods of mounting are open to objection. Aside from material for photographing, and the proper setting of the proboscis and hypopygium for study in certain forms, the reviewer decidedly favors leaving all flies in the natural attitudes assumed by them in the killing bottle. Specimens too small to be pinned with a No. 2 pin should be mounted on minute wire elbows wound on No. 3 pins. Only 34 to 39 mm. pins should be used, longer sizes giving trouble in the standard-depth cases. Great care should be taken not to get the specimen too high on the pin, but to leave sufficient room for grasping the head of the pin with the thumb and finger without danger of contact with the wings or other parts. There should be left sufficient space on the pin below the specimen for several labels, which