have also been made, and a considerable amount of work upon vine-diseases is reported.

Annual report of the Connecticut agricultural experiment-station, for 1886. New Haven, State. 8°.

Like most of the experiment-stations of the eastern states, the Connecticut station is largely occupied with the analysis of commercial fertilizers; about one-half of the space in the report for 1886 being occupied with the results of this work, while a considerable portion of the remainder is taken up with the analyses of feeding-stuffs sent to the station for examination, and other matter connected therewith.

Numerous analyses of milk and of butter and butter substitutes have been made, the latter for the state dairy commissioner, and also a few ash analyses of feeding-stuffs.

The most noteworthy portions of the report are the papers upon 'The agricultural value of horn-dust and of hoof and horn,' and upon 'Methods of mechanical soil analysis.'

In the former the method of pot experiments with fertilizers, worked out with great care and labor by Wagner, was applied, for the first time in this country, so far as the writer is aware, to the solution of an important practical question. It is to be hoped that further experiments of this sort by this and other stations may supplement their work on the analysis and commercial valuation of fertilizers.

The paper upon 'Methods of mechanical soil analysis' gives the results of tests of a new method, styled 'beaker elutriation,' by which a soil may readily be separated into sediments of any desired fineness in a very simple and expeditious manner, and without the use of expensive apparatus. Should the method prove, upon further trial, to be as accurate as these trials indicate, it will be a very substantial addition to our means of studying the physical properties of soils and their relations to fertility.

Mention should perhaps be also made of the notes upon analytical methods, which contain much of interest to the chemist. The report, as in previous years, shows that the work undertaken has been most thoroughly and conscientiously done. One can but regret that so great a proportion of the time and energy of the station's officers is taken up by routine work, and so little is available for really scientific investigation.

Fifth annual report of the board of control of the New York agricultural experiment-station, for the year 1886. Elmira, Advertiser assoc. pr. 8°.

As in previous years, the report of the New York experiment-station is largely devoted to the elaboration of the directors' idea of an agricultural botany; wheat, cabbage, and lettuce being the plants chiefly studied during the year, — the first by the first assistant, and the other two by the horticulturist. The attempt is made to classify the large number of varieties given and described into 'agricultural species' with distinct and reasonably permanent characters. It would appear that the success of the gentlemen interested with these tasks has not always been commensurate with their desires; but this was to be expected in such a comparatively new field, and any very vigorous criticism of the results would be premature.

In connection with these studies, a large number of collateral points have received more or less attention, many of them important in themselves, but so superficially treated as to render the results of the trials of little or no value. It seems to be very difficult for those in charge of these experiments to restrain themselves from following up for a little distance any collateral inquiry which suggests itself, and hence their work suffers from a certain lack of concentration.

In this latter respect the reports of the botanist, chemist, and assistant chemist contrast favorably with those just spoken of; in part, doubtless, on account of the nature of the work undertaken. The paper on 'Viscometry,' by the chemist, deserves more than a passing notice. By means of a simple and inexpensive apparatus he is able to determine with great accuracy the relative viscosity of liquids, and to show that it varies greatly as between different liquids, and may be made a very delicate means for detecting adulterations in certain cases. The method has thus far been applied chiefly to dairy products, and with very satisfactory results, although the investigations are not yet completed.

The New York report, as a whole, contains the records of a vast amount of labor; but in many cases it is only a record, and nothing more. While this is necessarily the case with large portions of the work, there are other portions whose value is practically lost for lack of a careful discussion of the results, and the value of the whole to the ordinary reader would be greatly enhanced by a more free employment of the resources of typography to indicate the divisions and subdivisions of the subjects considered.

CHALLENGER REPORTS.

THE present volume is devoted to the Crustacea (Isopoda, part ii., and Brachyura) and Polyzoa (part ii.).

In his first report on the isopods, Mr. Beddard dealt exclusively with the Serolidae; and the

Report of the scientific results of the exploring voyage of the Challenger. Zoölogy, vol. xvii. London, Government. 4°.

present part takes up the other families, and completes the description of this group. He has omitted detailed descriptions of species obtained by the Challenger but already known to science, except where needed for comparison with new forms; but when from a new locality or habitat, the fact has been recorded.

The Challenger collection is very rich in new species, especially among the deep-water forms, of which no less than thirty-eight are new to science. Among the shallow-water forms the greater number of novelties were from the neighborhood of Kerguelen and Australia. The benthal region is very irregular in its isopod fauna, if the dredgings of the Challenger afford a criterion. Over the central and southern Atlantic and central and western Pacific no species at all were found; but where any occurred, they seemed to comprise a considerable variety of forms. Thirty-four of the abyssal isopods are totally blind, three appear to have degenerate eyes, while eighteen have well-developed eyes. But of the eleven genera exclusively resident in the deep water, only two have eyes; of those remaining, seven belong to genera which in shallow water always have eyes; while the remaining eighteen species belong to genera which are blind whether in deep water or not. The differences are not easily explained. That some species should retain and others lose their eyes under apparently similar conditions, it is difficult to account for. Mr. Beddard suggests that those retaining eyes are probably the later emigrants to the abysses from the shallows.

The deep-sea isopods are remarkable for the development of spines on the body, especially in the Arcturi, and often attain extraordinary size; one, Bathynomus giganteus, reaching a length of nine inches. In these tendencies the abyssal species resemble those of the polar seas, where the temperature conditions are not dissimilar.

The report on the Brachyura, by Edward J. Miers, is devoted to a systematic account of the numerous species collected, with revision of the classification, and lists, as complete as possible, of the recent species of each genus not included in recent and accessible monographs. The genera have been rediagnosed on a uniform plan, thus furnishing a most useful supplement to these moncgraphs, and preparing the way for a catalogue of the Brachyura, — a work much needed by students of the higher Crustacea. The author regrets that ill health has prevented him from adding a bibliography and other useful details, and even from personally revising the proofs, and in general attaining the high standard of perfection which he aimed at, though doubtless such faults or deficiencies are much more apparent to him than to those who will gratefully appreciate and use the results of his arduous studies.

The abyssal region of the ocean affords no Brachyura at all, but few occur in depths of over five hundred fathoms. The great mass of the collection is from shallow waters, and its novelties chiefly from the less-explored coasts and islands of the Indo-Pacific region. There were but two species, both belonging to the genus Ethusa, taken in over one thousand fathoms: one of these, E. Challengeri Miers from 1875, is from the greatest depth recorded for any true crab.

The report on the Polyzoa Cyclostomata, Ctenostomata and Pedicellinea, by George Busk, possesses a melancholy interest as the last production of that veteran and indefatigable naturalist. The revision of the proofs was performed by him only a few weeks before his death.

Forty-six species were collected by the Challenger, of which thirteen are regarded as new. Of the thirty-three cyclostomate forms, thirteen had previously been known in a fossil state. This group alone reaches deep water; and of the species, only two were obtained from more than one thousand fathoms, and none from over fifteen hundred fathoms. One of the above dredged in sixteen hundred fathoms is also known from various depths up to fifty fathoms. None of the forms described appear to be particularly remarkable.

Dr. Chapman, in the *Medical and surgical reporter*, says that nine-tenths of wild animals in confinement are subject to heart-disease, although all animals have their peculiarities. The elephants are heirs to many diseases, but the most common and fatal is rheumatism. Monkeys and baboons generally die from bronchial affections and heart-disease; felines, such as lions, tigers, leopards, etc., from dysentery and heart-disease; deer, antelopes, etc., suffer most from dysentery and heart-disease; while the canine tribe, such as wolves, dingoes, and foxes don't seem to be subject to any disease except 'pure cussedness.' The only thing to be feared in the wolf tribe is too much sociability. It is unsafe to keep more than a pair together; otherwise they would eat each other.

— Under a law which has just passed the Minnesota legislature, the restrictions placed upon the practice of medicine in that state will be more severe than in any other part of the United States. All persons who wish to practise medicine after July 1 must pass an examination before a board of nine persons, irrespective of whether they hold regular diplomas or not, and only those who have taken three courses of medical lectures will be permitted to the examination.