of all the points representing observations, whatever be the shape of the ellipse of error.

The ratio of the magnitude of the vector-mean to the average speed, as a measure of the degree of permanence, or absence of dispersion, is shown to be unsatisfactory. In particular, this ratio fails to measure the scattering in speed when the direction of the current is constant.

J. P.

F. S. Russell. "The Seasonal Abundance of the Pelagic Young of Teleostean Fishes in the Plymouth Area. Part III. The year 1935, with a note on the conditions as shown by the Occurrence of Plankton Indicators." Journ. Mar. Biol. Assoc. N. S., Vol. XX, No. 3, pp. 595—604, 4 Fig. Plymouth, 1936.

Two previous reports by the author have served to establish a provisional average, based on eleven years observations, for the number of young Teleosts occurring in fortnightly catches with a stramin net in the Plymouth area. In the present paper the catch throughout the year 1935 is compared with the average so obtained and suggestions are made as to the correlation of the departures from the normal with the physical conditions, as determined both directly and by inference from the occurrence of other organisms which might be regarded as indicators of water of high or low phosphate content.

The year 1935 was marked at Plymouth by being the lowest on record in its production of young fish taken as a whole, the deficiency being spread uniformly over the whole year and shared by most of the species present. Comparing this with the annual winter maxima of the phosphate content of the waters off Plymouth, it was found that the phosphate, which since the winter of 1930—31 had been below the average, reached its minimum in 1934—35. Previous years had shown a correlation between a high phosphate content and the abundance of young fish.

G. P. F.

F. S. Russell. "Observations on the Distribution of Plankton Animal Indicators made on Col. E. T. Peel's Yacht 'St. George' in the Mouth of the English Channel, July 1935." Journ. Mar. Biol. Assoc. N. S., Vol. XX, No. 3, pp. 507—522, 6 Fig. Plymouth, 1936.

In some previous papers on the plankton of the mouth of the English Channel Mr. Russell put forward the proposition that certain easily recognized plankton organisms might be used as indicators of the various types of water which occur in that locality. The opportunity of a cruise at the mouth of the Channel in July 1935 in Col. E. T. Peel's yacht, with facilities for taking tow-nettings but not, apparently, water samples, allowed the author to test in actual practice his earlier conclusions. In general it may be said that they answered his expectations, but it is evident that they must be used with caution or rather with intelligence; for instance, two of the suggested indicators of what may still be designated as *Sagitta elegans* water, *viz.*, *S. elegans* and *Aglantha*, were also found plentifully in coastal channel water off Lands End, but only as small specimens. The suggested explanation is, not that a mass mixing of the two waters had occurred, but that the young stages, which occur mainly in the surface layers, were carried over by a surface drift.