of these old valleys were revived, but in other cases the streams followed new courses. The story of all these changes is clearly told by Mr. Reed, and although there is room for difference of opinion in matters of detail, the main results are based on fact; and the essay may be profitably studied by those interested in the origin of our scenery.

Fergusson's Surveying Circle and Percentage Tables. By J. C. Fergusson, M.Inst.C.E. Pp. 84. (Published by the Author, 1901.)

THIS is an account of a device intended to replace the dial or circles in magnetic compasses and surveying instruments, with numerous illustrations of its application for the purposes of engineers, surveyors, naval and military officers and travellers. Half of the circle is divided into octants, and the graduation of each octant is effected by dividing its tangent, which is equal to the radius, into 100 equal parts and then drawing lines from these divisions to the centre of the circle. The divisions on the octant thus always subtend equal spaces on an offset laid out at right angles to the quadrantal radius. The spaces on the octant divided in this manner correspond to a hundredth part of the radius, and the angles being read in percentage divisions, trigonometrical formulæ are replaced by simple arithmetic. A considerable simplification of several practical problems is suggested by the examples given, but the advantages of the method can scarcely be judged without actual experience. It is stated, however, that many distinguished engineers and surveyors have expressed complimentary opinions as to its merits. Messrs. T. Cooke and Sons are the manufacturers of the new circle, which can be adapted to old or new instruments.

How to Know the Indian Ducks. By F. Finn. Pp. iv+101. (Calcutta: Thacker, Spink and Co., 1901.)

IF the right to include under the name of "ducks" both geese and swans be conceded to the author (and we have some doubt whether it should be), we have nothing but commendation for this excellent little volume. Years ago, when duck-shooting on the Ganges, we have a vivid recollection of our own regret at being unable to identify all the various representatives of the duck tribe included in our "bag," and we have little doubt that this regret has often been shared by other sportsmen. For the future, however, there should be no difficulty whatever in determining the species of any member of the tribe which may fall to the gun of the sportsman in India, as Mr. Finn's volume is small enough to be carried in the pocket without inconvenience, while the lowness of its price brings it within reach of every one. Needless to say, as the author is an accomplished ornithologist who has devoted special attention to the Indian Anatidæ, the descriptions are all that can be desired from a scientific point of view, while the simple language in which they are written, and the useful "keys" for the identification of species, render the volume admirably adapted to the needs of sportsmen.

It is for this class, indeed, that the work is primarily intended, as the author tells us in his preface; and the fact that the substance of the text has already appeared in the form of a series of articles in the columns of the *Asian* newspaper bears testimony to its favourable reception by Anglo-Indian sportsmen.

On more than one occasion we have directed attention in these columns to the confusion caused by the diverse systems of nomenclature followed by ornithological writers. In the present instance we are glad to see that the author endeavours to promote uniformity in this respect by following the classification and nomenclature adopted by Mr. W. T. Blanford in the "Fauna of British India." R. L.

LETTERS TO THE EDITOR.

[*The Editor does not hold himself responsible for opinions expressed by his correspondents. Neither can he undertake to return, or to correspond with the writers of, rejected manuscripts intended for this or any other part of* NATURE. *No notice is taken of anonymous communications.*]

On the Determination of Positions in Polar Exploration.

HAVING in view the importance of this subject in connection with the forthcoming Antarctic expedition, a brief comment on the results obtained in high latitudes, with which we have been favoured during the last few months, may not be out of place. The publication of the scientific results of the Nansen expedition is now before us, and these, together with a few which (without further explanation perhaps) scarcely merit the employment of this adjective, and which are to be found in the pages of Mr. Borchgrevink's account of the *Southern Cross* expedition, afford food for reflection, but whether they could be more satisfactorily dealt with by a professional man of science or a professional humorist may be open to question. The first have resulted in a series of deductions and suggestions which will strike thoughtful men as being eminently unpractical, and the latter is responsible for considerable confusion of mind in regard to the geographical positions of the most important points to which the expedition just about to start is instructed to proceed.

These being for the moment the more important, may be dealt with first. It has already been pointed out by NATURE that the recorded observations of the Borchgrevink expedition are extremely unsatisfactory, owing, possibly, to the work of a copyist ignorant of nautical calculations, but besides being improperly copied they are improperly computed. One, owing to the use of the secant of an erroneous latitude, is made to produce a longitude 22′ in error. Another computes the declination with a correction for longitude instead of for the Greenwich date. A third professes to find the chronometer error to a couple of seconds by a lunar eclipse (a feat which, if true, is miraculous); and a fourth produces a longitude of the harbour under the great ice barrier from which Mr. Borchgrevink effected his landing which is said by the navigating officer to be 164° 32′ W., by the commander 164° 10′ W., and by the president of the Royal Geographical Society 162° 30′ W.

The position of Cape Adare, again, is of the very first importance. Ross placed it in 71° 18′ S.; Mr. Borchgrevink finds this latitude correct, but places it 36′ further to the East; while Sir C. Markham, if we may judge by the *Geographical Journal* for July, has apparently been informed that it lies in lat. 71° 30′ S.

Much satisfaction has been expressed at the supposed verification of the position of two groups of islands (the Balleney groups), but much astonishment has also been expressed by thinking men that the Geographical Society can attach the faintest importance to the determination either of their number or their position by officers who, in discussing the subject, contradict each other flatly both as to the date, the appearance and the distance of the land at the time of the discovery; to say nothing of the suggestion that at distances ranging from 90 to 40 miles abundance of detail, including crevasses, and the shore line were plainly visible.

Turning to the scientific results of the Nansen expedition, and having in view the remark of your reviewer (NATURE, June 13), that the volume is to be welcomed as exceedingly opportune in view of the approaching Antarctic expedition, I should like to call the attention of the scientific staff to certain information which they may find it interesting to put to a practical test. It is here suggested:—

(1) That the value of refraction can be estimated from astronomical observations taken during a drift, when the latitude by which the altitudes are computed depends upon the unknown refraction and the refraction upon the unknown latitude. (See table of refractions).

(2) That the altitudes necessary for the computation of a lunar distance can be calculated by a man having no knowledge of his Greenwich time and being uncertain of his longitude to the extent of from 15 to 25 degrees. (See Nansen's lunar, taken August 10, 1895).

(3) That the discrepancy between two sets of altitudes taken, the one with a glass horizon labouring under suspicion and the