superphosphate drilled with the seed would be found quite sufficient, and probably fully equal in effect to twice the quantity of phosphoric acid applied as powdered coprolite.

Phosphate of iron applied alone was found to have practically no effect on the turnip crop, and the effect of phosphate of aluminium was but little; this is pretty much as we should expect. There is apparently some mistake in the printed analysis of the phosphate of aluminium used, as it is made to contain 38·28 per cent. of lime, and only 4·76 per cent. of ferric oxide and alumina.

The analyses given of the turnip soils cannot pass without a word; the reporter is surely unaware of the absurdity which these analyses present. The soil of the unmanured plot in the five experimental fields was analysed in 1876, and again in 1879, after three turnip crops had been taken. The analyses show that on an average about 20 per cent. of the nitrogen, and about 48 per cent. of the phosphoric acid in the soil had been removed during these three years, and yet the total weight of the three turnip crops grown on the five fields during this period averaged but 16 tons per acre! The only remark made by the reporter on these figures is that the soil has evidently become reduced in nitrogen, and much reduced in phosphates; the fact that either the soil sampling or the analyses must be utterly wrong seems to have altogether escaped his attention.

The experiments with oats do not call for any special remark, except to note the patience which shelled 136,000 grains by hand in order to determine the proportion of kernel to husk in the produce of the various plots.

May we suggest that in a report of field experiments the dates of sowing and of harvest should always be given, and also a description of the character of the weather during the growing period. Without such facts before us it is impossible to interpret the results of field experiments.

Proceedings of the London Mathematical Society. Vol. xi. (November, 1879, to November, 1880).

THIS is a smaller volume than usual, there being fewer papers, and none of them of a great length. The pure mathematics prevails somewhat more than usual over the mixed.

Prof. Cayley contributes articles "On the Binomial Equation $x^p - 1 = 0$; Trisection and Quartisection," a theorem in spherical trigonometry, on a formula of elimination. Sir James Cockle writes "On a Binomial Biordinal and the Constants of its Complete Solution." Mr. J. W. L. Glaisher, "On a Method of obtaining the q-formula for the Sine-amplitude in Elliptic Functions"; Mr. H. W. Lloyd Tanner, "Notes on a General Method of Solving Partial Differential Equations of the First Order with several Dependent Variables," and a preliminary note on a generalisation of Pfaff's Theorem; Mr. J. J. Walker, "Theorems in the Calculus of Operations"; and Mr. T. R. Terry, "Notes on a Class of Definite Integrals." Papers of a geometrical nature are—Mr. J. Griffiths, on a geometrical form of Landen's theorem with regard to a hyperbolic arc, and on a class of closed curves whose arcs possess the same property as two Fagnanian arcs of an ellipse; Mr. H. Hart, on the focal conics of a bicircular quartic; Mr. H. M. Taylor, on the equation of two planes which can be drawn through two given points to touch a quartic; Rev. J. Wolstenholme, a form of the equation determining the form and directions of a conic whose equation in Cartesian co-ordinates is given. Dr. Klein of Leipsic has a short note on the transformation of elliptical functions; Mr. Greenhill applies elliptic co-ordinates and Lagrange's equations of motion to Euler's problem of two centres of force; and Mr. Routh writes on functions analogous to Laplace's functions. Lord Rayleigh's papers are on reflection of vibrations at the confines of two media between which the transition is gradual, and on the stability or instability of certain fluid motions. Mr. Samuel Roberts has two notes: one on a problem of Fibonacci's, and the other on the integral solution of $x^2 - 2Py^2 = -z^2$ or $\pm 2z^2$ in certain cases; Mr. R. F. Scott writes on cubic determinants and other determinants of higher class, and on determinants of alternate numbers (a treatment which he has adopted in his work on "Determinants"). Mr. Hugh McColl contributes a fourth paper on the calculus of equivalent statements (cf. Prof. Jevons's remarks, NATURE, vol. xxiii. p. 485). Other minor articles conclude the volume.

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. No notice is taken of anonymous communications.*

[*The Editor urgently requests correspondents to keep their letters as short as possible. The pressure on his space is so great that it is impossible otherwise to ensure the appearance even of communications containing interesting and novel facts.*]

The New Museum of Natural History

THE new Natural History Museum, opened on Easter Monday, was visited by some 16,000 people of a most orderly and respectable class. Owing to the great exertions of Dr. Woodward, whose zeal is beyond praise, the main gallery, the Pavilion, and the Gallery of Reptiles were shown in a practically completed state. The Mineral Gallery has long been ready, but the arrangement of the botanical section is still incomplete, and it was entirely closed. Some little trouble was caused with the umbrellas, and it might be worth while to consider whether, except perhaps in wet weather, the umbrellas need be taken away. The idea that people poke with sticks at objects in museums has been long exploded, and no inconvenience is felt at the Kensington Museum, the Louvre, and nearly all foreign galleries and exhibitions, where umbrellas are admitted.

The architecture in the Mammalia Gallery is very obtrusive, and its over-ornate character and the variety of tone of the terra-cotta, and the similarity of this in colour to the skulls and skeletons of the fossil mammalia, are most unfortunate.

It seems a pity that some style with more repose than "Decorated Norman" was not selected. Although very beautiful as a building, and with many features deserving high praise from an architectural point of view, it is evidently not the style best adapted to set off natural-history specimens. The cathedral like Index Museum, with its rather dark side-chapels, and the Museum of British Zoology are of proportions that will render it difficult to make an effective display in them.

I hope that it is not finally decided to place the recent mammalia on the first floor and the birds on the ground floor, because the architect's string courses would be interfered with otherwise by the cases. The living and extinct mammalia should face each other, and the birds go aloft. Convenience has already been too much sacrificed to architecture. Every time the first floor is visited the length of the Index Museum, 150 feet, must be traversed to reach the stairs, and the same distance back along the corridor to reach the door of the Mineral Gallery. This means an immense waste of time. I also notice that the crane is close to the main entrance, and that there are no proper lifts.

If it was necessary to fashion all the ornaments from natural-history objects, it is a pity that the restorations were not accurately made. The oft-repeated figure of a Dapedius swallowing a fish almost its own size, and of spiral shells bent to accommodate them to the mouldings of an arch, is not instructive. The humour of ornamenting (?) the arch leading into the pavilion with a hideously-represented Archæopteryx in high relief, repeated a dozen times, is not obvious, but some joke must doubtless be intended.

The cost of the small bronze and glass conservatories in the botanical department is out of all proportion to the objects they are to contain. Dried stems of tree-ferns and palms, though very interesting in their way, do very well in other museums without glass cases, and can be replenished for next to nothing.

F. G. S.