and its order was a necessary adjunct to the classificatory sciences ; and in nearly all his references to Speusippus he insists upon this fundamental difference of procedure. Conceiving that the motions of the universe and its parts are due to the desire which it and they feel towards the supreme external mind, so that the cosmical order is initial in the divine mind, final in the phenomenal universe, Aristotle supposes himself thus to secure the requisite unification of the variety of things. Contrariwise, when Speusippus distinguishes One, Good, and Mind, so that Mind, not as yet endowed with an orderly scheme, adapts the initial One to a variety of particular Goods, his theory of nature appears to his rival “ episodical,” *i.e.*, to consist of a series of tableaux wanting in dramatic unity, so that it reminds him of Homer’s line—*oὐκ ἀγαθὸv πoλυκoιραvίη · εἱς* *κoίραvoς ἔστω.* The theory propounded by Aristotle himself is not perhaps impeccable in this respect, but at any rate he does not, like Speusippus, despair of a solution of the traditional problem of the One and the Many.

Speusippus and his contemporaries in the school exer­cised an important and far-reaching influence upon Aca­demic doctrine. When they, the immediate successors of Plato, rejected their master’s ontology and proposed to themselves as ends mere classificatory sciences which with him had been means, they bartered their hope of philo­sophic certainty for the tentative and provisional results of scientific experience. Xenocrates indeed, identifying ideal and mathematical numbers, sought to shelter himself under the authority of Plato ; but, as the Xenocratean numbers, though professedly ideal as well as mathematical, were in fact mathematical only, this return to the Platonic termino­logy was no more than an empty form. It would seem, then, that Academic scepticism began with those who had been reared by Plato himself, having its origin in their acceptance of the scientific element of his teaching apart from the ontology which had been its basis. In this way, and, so far as the present writer can see, in this way only, it is possible to understand the extraordinary revolution which converted Platonism, philosophical and dogmatic, into Academicism, scientific and sceptical. It is as the official representative of this scientific and sceptical depart­ure that Speusippus is entitled to a place in the history of philosophy.

*Bibliography.—*J. G. F. Eavaisson, *Speusippi de primis rerum principiis placita,* Paris, 1838 ; Chr. Aug. Brandis, *Gesch. d. Griech­isch-Römischen Philosophie,* Berlin, 1853, II. ii. 1, pp. 6-19 ; Zeller, *Die Philosophie d. Griechen,* Leipsic, 1875, II. i. 839, 840, 847-862 ; Mullach, *Fragmenta Philosophorum Græcorum,* Paris, 1881, iii. 62-99. (H. JA.)

SPEY, a river in the north of Scotland, rises in the south-east of Inverness-shire from a small tarn called Loch Spey, 5 miles east of the Caledonian Canal, and flows north-eastwards by Kingussie to Grantown in Elginshire, 10 miles below which it reaches Banffshire. After forming for about 15 miles the boundary between Elginshire and Banffshire, it again enters the former county, through which it flows for about 10 miles past Fochabers to the Moray Firth. In the earlier part of its course it is fed by a large number of mountain streams, its principal tribu­taries being, in Inverness-shire, the Tromie and the Feshie from the right and the Dulnain from the left, and on the boundaries of Banff and Elgin the Avon (Aven) and the Fiddich from the right. Its entire length is 96 miles, and it drains an area of about 1200 square miles. The flow of the river is very rapid, and, being fed largely by mountain streams, it is subject to sudden freshets, which sometimes occasion extensive floods, the greatest being that of 1829. The Spey is, next to the Tay and the Tweed, the most important salmon river in Scotland. The scenery in its upper courses is occasionally bare and bleak, but some­times finely picturesque, especially where, as in Elginshire

and Banffshire, its bold and rocky banks are clothed by forests of birch and pine.

See L. Shaw, *History of the Province of Moray* (1st ed. 1775, 3d ed. 1882), and Sir Thomas Dick Lauder, *Account of the Moray Floods* (1st ed. 1830, 4th ed. 1873).

SPEZIA, a city of Italy, in the province of Genoa, 56 miles south-east of Genoa by the railway to Pisa, which has become since the unification of the kingdom one of the principal Italian ports and the seat of a great Govern­ment arsenal. It is situated at the north-west angle of the Gulf of Spezia, formerly known as Lunæ Portus, the western side of which is formed by a rocky promontory about 4 miles long, terminating in the picturesque little town of Portovenere and the islands of Palmaria and Tino. A great breakwater, constructed about 1860, stretches across the gulf from Santa Maria Point to Santa Teresa Point for a distance of 7220 feet; and the outer harbour to the south-west of the town, excavated in 1865 to a depth of 32 feet, has an area of 247 acres. The arsenal has a length of 3937 feet and an average breadth of 2460 feet. The first dock covers an area of 20 acres and the second 17 acres; and there are besides two careening basins, 433 and 354 feet long. Farther south lie the extensive mili­tary establishments of San Vito, with storehouses, reser­voir, &c. ; and almost right opposite, on the other side of the gulf, are the dock (11/2 acres), shipbuilding yards, and repair­ing docks of San Bartolomeo. Some of the largest vessels of the Italian navy have been constructed at Spezia. As a commercial centre Spezia suffers from the lack of railway communication with the interior,—the range of the Apen­nines lying between it and the more productive regions of Northern Italy. The whole movement of the port in 1884 was represented by 38 vessels engaged in foreign trade (tonnage, 29,251) and 1333 engaged in the coasting trade (tonnage, 198,447). Though the town itself, with the barracks and military hospital as its principal buildings, presents little to attract the foreign visitor, the beauty of the gulf and of the neighbouring country has brought Spezia into some repute as a watering-place, and there are several excellent hotels in the Corso. The walls and gates of the old city are for the most part destroyed. In one of the public squares is a statue of Admiral Chiodo, the founder of the arsenal. The population of the city was 6105 in 1861 (commune 11,556) and 19,864 in 1881 (commune 30,732).

The origin of Spezia is doubtful ; but it probably rose after the destruction of Luna. Sold by one of the Fieschi in 1276 to Genoa, the town was fortified by its new possessors and made the seat of a governor of some importance. It became a city in the 16th cen­tury. The idea of making the Gulf of Spezia a great naval centre was first broached by Napoleon I.

SPHEROMETER, an instrument for the precise mea­surement of the radius of a sphere or the thickness of a thin plate. The usual form consists of a fine screw moving in a nut carried on the centre of a small three-legged table. The lower end of the screw and those of the table legs are finely tapered and terminate in hemispheres, so that each rests on a point. If the screw has two turns of the thread to the millimètre, the head is usually divided into 500 equal parts, so that differences of 0Ό01 millimètre may be measured without using a vernier. A vertical scale fastened to the table indicates the number of whole turns of the screw and serves as a fixed point for reading the divi­sions on the head. In order to measure the thickness of a plate the instrument is placed on a level plane surface and the screw turned until the point just touches ; the exact instant when it does so is defined by a sudden diminution of resistance succeeded by a considerable in­crease. The divided head and scale are read ; the screw is raised ; the thin plate slipped under it ; and the process is repeated. The difference between the two readings gives