

IX.—*On the difference of level between the Black Sea and the Caspian.* Communicated by the Baron ALEXANDER VON HUMBOLDT.

THE kindness of M. Kupffer, Corresponding Member of the Society at St. Petersburg, enabled us to give, at p. 426, Vol. vi. of the Geographical Journal, some account of the Russian expedition about to be sent forth, in 1836, to determine the long-contested point of the difference of level between the Black and the Caspian Seas. That expedition has fulfilled its object.

The trigonometric levelling along the line of country between Novo-T'cherkask, by Stavropol, to Kisliar, is now completed, and although the detail of the survey has not yet reached London, yet the fact of the determination of so remarkable a point in physical geography is too important not to find a place in the Geographical Journal, especially as the Society is indebted for the communication of it to one of its most distinguished Foreign Members.

“ *Berlin, Jan. 10, 1838.*

“ The beautiful trigonometric levelling between the Black and the Caspian Seas is at length finished. There is a depression, but a much less depression than M. Parrot had announced after his first barometric levelling by stations; this always appeared to me probable (see my letter to M. Parrot, inserted in his ‘*Voyage à l’Ararat*,’ vol. ii. p. 192), on account of the elevation of Kasan (level of the junction of the Kasanza and the Wolga), and on account of some corresponding observations which I obtained during my journey to the Caspian. The levelling of MM. Fuss, Sabler, and Sawitch, shews that the level of the Caspian is 101.2 Russian feet, equal to 94.9 Paris feet (old measure), lower than the level of the Black Sea.

“ The height of Kasan has been much discussed, and all travellers have assumed different heights; at page 639 of the volume published by M. Gustave Rose, I have given the latest results of the labours of the astronomer Simonoff, professor at Kasan. The cistern of the barometer in the building of the University (Universitäts Gebäude) at Kasan, has an elevation of 181 Paris feet; the junction of the Kasanza and the Wolga is 53 feet (8.9 toises) above the level of the ocean. The fall of the Wolga from Kasan to the Caspian would be then 148 feet, or 24.7 toises. In a direct line it is about 157 geographical leagues (of 15 to the degree) from Kasan to the Caspian. This is a greater inclination than that of the Amazon or the Nile, and almost as great as that of the Oder. The most striking fact is the little elevation of part of the interior of the East of Europe above the level of the ocean, since from Kasan to the Icy Sea it is 135

geographical leagues. The city of Berlin, so near the Baltic, is 100 feet above the level of the sea, according to an excellent trigonometric levelling, which the chief of the staff corps has, at my request, caused to be executed during last year, by the able observer M. Bäyer.

“ I cannot sufficiently congratulate the Geographical Society on having found so excellent a traveller as M. Schomburgk : his latest labours, the ascent of the Rivers Corentyn and Berbice, in Guayana, place him very high in my opinion ; and the zone of hieroglyphic figures, sculptured in the rocks from Encamarada, in $66^{\circ} 50'$ W. longitude, as far as the eastern limit of British Guayana, a distance of nearly 600 miles, is an ethnographical phenomenon which daily increases in interest.

“ The astronomical geography of the North of Asia will shortly be set right by the publication of the important labours of M. Federow, *élève* of M. Struve, who has recently returned, after a five years' absence. Should I still publish the detail of my astronomical observations in Siberia, it will only be in order to fix more accurately the points where I have made observations on terrestrial magnetism.

“ I learn with the greatest satisfaction that my letter to the Duke of Sussex, on the subject of Magnetic Observatories, has produced some useful results. As we make observations here both with the needle of Gambey, furnished with microscopes and with the new apparatus of Gauss, an apparatus furnished with a mirror, we have an opportunity of convincing ourselves more and more of the great perfection of this mirror apparatus, which doubtless requires greater skill and more instruction on the part of the observers ; the tracing of the curves of horary variation, based upon observations made across all Europe for every five minutes of time (see Gauss und Weber, *Resultate aus den Beobachtungen des Magnetischen Vereins im Jahr 1836* ; Göttingen, bei Dietrich, 1837), will prove what advantage is derived from making use of the apparatus of Gauss, which doubtless will soon be employed in all our great observatories.

“ As I think that this subject is not without importance to Seamen, I beg you to invite the leading Members of the Geographical Society to be good enough to propagate Gauss' manner of observing in all new stations, where intelligent persons can be found. Points near the Magnetic Equator, and those which are in high latitudes in the southern hemisphere, as the Cape of Good Hope, Australia, Van Diemen's Land, would be the most desirable, if they would observe at the same epochs indicated by M. Gauss, and followed throughout the North of Asia, in Germany, in Sweden, and at Milan.”