magnitude. Taking a mean of the five observations of position, and reducing to 1880, its R.A. is 7h. 35m. 8·0s. and N.P.D., 159° 0′ 46″.

We do not hear of recent observation of the nebula situated near ζ Tauri, which was discovered by Chacornac, and which was sufficiently bright from 1855, October 19, to 1856, January 27, to "cause surprise that it had not been inserted by Mr. Hind upon his ecliptic charts," though it was not perceived on the meridian even with a refractor of 25 centimetres from 1853, December 3, to 1854, December 17. In 1855–56 the nebula was projected upon a star of the eleventh magnitude, the position of which for 1880 is in R.A. 5h. 30m. 16·0s. and N.P.D. 68° 51′ 29″. Chacornac says: "Elle offrait une forme presque rectangulaire, dont le plus grand côte soutendait un angle de trois minutes et demie, et le plus petit un arc de deux minutes et demie." D'Arrest, 1863, September 82, could not perceive any nebulosity about the star, nor, 1165, January 25, "cœlo valde eximio." He notes that the star is double, estimated distance 40″. It precedes ζ Tauri 12·5s., and is north of it 4′ 28″.

Some years since the approximate places of three nebulosities remarked with the comet-seeker at Cambridge, U.S., by Mr. G. P. Bond, but subsequently missed, were published. One seen 1850, February 27, in R.A. 0h. 47m. 41s. ± 1m., N.P.D. 26° 36′ ± 19′, could not be found 1863, September 9. A faint and rather large nebula, seen 1850, December 30, was not to be found, 1863, August 17; R.A. 14h. 37m. ± 3m., N.P.D. 67° 0′ ± 30′, and a third nebulosity resembling a comet, observed 1850, November 7, in R.A. 23h. 50m. 46s., N.P.D. 123° 24′, requires verification; the place is for 1850.

GEOGRAPHICAL NOTES

UNDER the direction of the United States Hydrographic Office, Lieut.-Commander F. M. Green, U.S.N., and the officers under his command, have during the last four years been engaged in determining exactly secondary meridians of longitude by means of the submarine telegraph cables in the West Indies and South America. The result of the West India work in 1874, 1875, and 1876 was the determining the latitude and longitude of a large number of points in the West Indies with the utmost possible exactness; and during the past year this work, of the greatest value to geographical and geodetical science, has been continued by making a chain of telegraphic measurements from the Royal Observatory at Lisbon, by way of Madeira, St. Vincent, Pernambuco, Bahia, Rio de Janeiro, and Monte-Video to Buenos Ayres, there connecting with the observatories of Cordova and Santiago. This chain is perfect, with the exception of one link on the coast of Brazil, where the cable was broken, necessitating the procuring of new cable from England; but its completion will be effected before the computation of the observations already made can be finished. The method used for determining the latitude was in all cases that of the zenith telescope, brought to great perfection by the United States Engineers and the Coast Survey; that for differences of longitude, the comparison by repeated telegraphic signals of two chronometers at the ends of the telegraph cable, determining their errors both before and after the comparison by numerous transits of stars over the meridian. All that is needed to make the work of the last year perfect and complete is the telegraphic determination of the differences of longitude between the Greenwich and Lisbon observatories, and the completion of the imperfect link on the Brazilian coast, both of which will be done during the coming year. Until the observations have been carefully discussed, the results as compared with former determinations cannot be known exactly, but a preliminary computation indicates that the longitude of the coast of Brazil is laid down about three or three and a half miles too far west, this westerly error being indicated in a less degree in the longitudes of Madeira and St. Vincent.

LORD AUGUSTUS LOFTUS has recently forwarded to the Foreign Office, from St. Petersburg, a translation of a Russian letter from Cabul, descriptive of the journey of General Stoletoff's mission from Samarcand, which supplies some notes of interest respecting the country traversed. The road selected for reaching the Oxus was through Huzar, Shirabad, and Chushkogosar, which was traversed in five days. On this route the mission passed through the famous defile known in ancient times under the name of the "Iron Gates," and now called Burghasse Khana. The mission crossed the Oxus in very primitive boats, and marching by night, passed over a sandy arid steppe, and next morning reached Kurshiak settlement, situated in a cultivated country. They made three stages before reaching Mizar and Sheriff, where great crowds thronged the streets, and gazed with curiosity on the people from the distant north. After leaving Tashurgan, the party reached the spurs of the Hindu Kush, and journeyed to Cabul during twenty days. Ascending at first in gentle slopes, the Hindu Kush gradually rises higher and higher, forming, amidst its frequent passes, terraces of increasing height. After traversing a series of such terraces, the mission reached the elevated Bamian Valley (8,500 feet), near which are the Kalu and Great Tran Passes (13,000 feet). Passing the famous Bamian idols, chiselled on the face of the rock, they emerged from the last-named pass, and then descended from the Ugly Pass into the Cabul Darya Valley, at a place three days' journey from the capital of Afghanistan.

THE French papers published last week news from the Gaboon settlements stating that the Ogowe exploring mission had arrived in Libreville, the head city of the colony. A telegram read at the last sitting of the Paris Geographical Society announced that M. Brazza, the chief of the mission, had arrived in Lisbon with some of his subordinates, on his way to Paris. It was expected he would arrive in time for the meeting of the Society on Tuesday. The exploration of the mission has lasted three years, and many highly important results are said to have been obtained.

AT the last sitting of the Paris Geographical Society M. de Lesseps read a telegram received from Capt. Roudaire, stating that he had found nothing but compressed sand when boring to a depth of 30 metres in the Gabes Isthmus, so that no real difficulty prevented the opening of it for the intended Saharan Sea.

ON the authority of Mr. Oscar Dickson, it is stated that the Nordenskjöld expedition is wintering forty miles north of Cape East in Behring Straits. This news has been given to American whalers by a party of trustworthy natives, and a number of whalers are said to be wintering with the *Vega*.

THE just issued October *Bulletin* of the Paris Geographical Society contains a long paper by M. Léon Rousset, giving the results of a journey in the upper basin of the Yellow River and the region of the loess which overspreads so large an area of China, and of which Richthofen makes so much in his great work on China. M. Dutreuil de Rhins contributes a very useful account of Annam and the province of Hué; M. H. Harrisse discusses the question of the burial-place of Columbus, and M. d'Abbadie concludes his useful description of the instruments to be used in travel.

A LITTLE work on Afghanistan has just been published by Dr. Josef Chavanne, the author of the excellent work on the Sahara. It is written with special reference to the

present war, and gives a detailed description of the country and its geographical character, as well as of its inhabitants, from an ethnographical as well as a social point of view. The natural resources and military power of Afghanistan are described, and particular attention has been paid to an account of the communication between India and Afghanistan, the lines of operation, and the numerous mountain passes. There are several illustrations and an excellent map. It is published by Hartleben, of Vienna.

IN a recent voyage from Melbourne to the Fiji Islands, the steamer *Ariel* called at Lord Howe Island, where twenty-five people in all were found. The island is mountainous, of volcanic origin, but well-wooded, about five miles long, and from one and a half to two miles broad, and is situated some 400 miles east of Sydney. The communication of the inhabitants with the outer world is nowadays very uncertain, as whalers but rarely visit them.

THE MUSICAL ASSOCIATION[1]

THE question, In what way does science enter into the subject of music? is one that by no means admits of an easy answer. If we were to put it to various persons interested in music in different ways we should find their opinions most vague and contradictory. A university scholar, or a physical lecturer, would make the science of music consist entirely in the doctrines of acoustics; while, on the other hand, we should find some of the most eminent musical professors telling us that these had nothing to do with music at all, but that science meant the study and application of the rules of musical composition. Or possibly it might even be held that a skilful manipulation of the violin, or an appropriate management of the voice in singing, or an intelligent phrasing of pianoforte passages, or other refinements of execution, constituted all the science that musicians need aspire to.

A quarter of a century ago such a question would have excited no interest. People in general were satisfied to take the art as they practically found it, and troubled themselves but little as to the principles on which it was based. But the march of knowledge has changed the aspect of the matter. Modern philosophical investigation has included music in the universality of its aims, and the musician, however conservative, must submit to a searching inquiry as to the real nature of the stuff in which he deals.

The great work of Helmholtz, published in 1863, gave the first real stimulus to scientific musical inquiry; and although many years passed before it became much known in this country it at length aroused attention, and some of the most intelligent students of the art began to see that there was really something to be inquired into—the first step towards accurate knowledge of any kind. They observed the beneficial operation of the learned societies, where papers on the subjects they embraced were brought forward; and the idea occurred to them that an association of a similar character for music would not only enable the scientific questions connected with it to be publicly discussed, but might also be made conducive to the welfare of the art in a practical point of view. The idea was mentioned to one of the most eminent men of science (now president of the Royal Society), who, warmly approving it, issued the following circular:—

"50, *Grosvenor Place, April* 8, 1874

"DEAR SIR,—It has been suggested by several leading persons interested both in the theory and practice of music, that the formation of a society similar in the main features of its organisation to existing learned societies would be a great public benefit. Such a musical society might comprise among its members the foremost musicians, theoretical as well as practical, of the day, the principal patrons of art, and also those scientific men whose researches have been directed to the science of acoustics and to kindred inquiries. Its periodical meetings might be devoted partly to the reading of papers upon the history, the principles, and the criticism of music, partly to the illustration of such papers by actual performance, and partly to the exhibition and discussion of experiments relating to theory and construction of musical instruments, or to the principles and combinations of musical sounds.

"With a view to ascertain the opinions of persons interested in these subjects, and to attempt a more precise definition of the objects and constitution of such a society, it is proposed to hold a meeting here, at which your presence is requested on Thursday, April 16, at 2.30 P.M.

"I am, dear sir, yours faithfully,

"(Signed) W. SPOTTISWOODE"

This led to the formation of the Association whose proceedings are mentioned at the head of this article. The rules were judiciously framed, so as to avoid the rocks on which former musical societies had been shipwrecked; and the society has now gone successfully through four sessions. We learn from the report just issued, at the commencement of the fifth year, that the finances are prosperous, that the meetings are well attended, that the officers are zealous and efficient, and that a series of good papers are forthcoming for the future; from all which it may be fairly inferred that the institution has taken a permanent position.

The character of the society is, of course, best displayed by the contents of its *Transactions*. We cannot pretend to review the thirty-six papers (some of them very elaborate) contained in the four volumes before us; it will be an easier course to indicate briefly, in the first instance, what are the "subjects connected with the art and science of music" which more especially deserve "investigation and discussion," and then to see how far the papers actually presented to the Association have fulfilled the object aimed at in its title.

Giving precedence to science, one may conceive that the "Principles and Phenomena of Acoustics" would claim attention. It is true, as has already been hinted, that some eminent practical musicians repudiate the relevancy of these inquiries, and discourage their study, on the ground that a knowledge of acoustics is unnecessary to the practical musician, whether composer or performer.[2]

But fortunately the general spread of education sufficiently disposes of arguments of this kind. There are, and no doubt always will be, persons who are satisfied with the minimum amount of knowledge to enable them to earn their daily bread, but it is to be hoped the number is decreasing every day. A man who lives by an art will, if his mind be properly constituted, be in no wise reluctant to learn all he can about it, even though the knowledge may not be immediately convertible into money. Musicians must, in spite of the disparaging opinion of some of their leaders, be treated as intelligent beings, who have minds capable of enlightenment and instruction, and surely there is nothing unreasonable in assuming that the philosophical principles on which their art depends must present some interest to them, if laid before them in an intelligible form. The doctrine that such knowledge should be confined to cultivated amateurs, and forbidden to professional musicians, is simply a libel on the intelligence of those to whom we owe enjoyment of so high an order. If, then, these principles are to be studied, the science of acoustics must necessarily form the basis of the study. The splendid

[1] Proceedings of the Musical Association for the Investigation and Discussion of Subjects connected with the Art and Science of Music. Vols. i. to iv. First Session, 1874-5; Second Session, 1875-6; Third Session, 1876-7; Fourth Session, 1877-8.

[2] It is a remarkable example of this view that in a new elaborate and voluminous English "Dictionary of Music," now in course of publication, the word *Acoustics* finds no place.