lower altitudes, the writer asserts that the time is generally more favorable for vision in the afternoon, and that it is at sunset that one obtains the best views in the Alps.

—The geographical society of Lisbon has recently published a list of the journals in the Portuguese provinces, printed in that language. This list includes the names of nineteen in Angola, six at Cape Verde, seven in China, two in Guinea, fifteen in English India, seventy-two in Portuguese India, seventeen in Macao and Timor, ten in Mozambique, and three in the island of St. Thomas. In addition, seventeen are published in Portugal, which are devoted to the interests of the foreign Portuguese provinces.

—Interesting experiments have lately been made by Dr. Parsons, we learn from *Health*, on disinfection of clothes and bedding by heat. These experiments, among other points, have shown what degree of heat, and duration of exposure, are necessary under different conditions (e.g., of moisture and dryness) in order to destroy with certainty the germs of infectious disease. The net results of Dr. Parsons's experiments on this head are as follows: with the exception of spore-bearing cultivations of the bacillus of splenic-fever, all the infective materials reported on were destroyed by an hour's exposure to dry heat of 220° F., or five minutes' exposure to steam at 212° F. Spores (or the reproductive particles) of this bacillus required for destruction four hours' exposure to dry heat of 220° F., or one hour's exposure to dry heat of 245° F., but were destroyed by five minutes' exposure to a heat of 212° F. in steam or boiling water. It may therefore be assumed that the germs of the ordinary infectious diseases cannot withstand an exposure of an hour to dry heat of 220° F., or an exposure of five minutes to boiling water or steam of 212° F.

LETTERS TO THE EDITOR.

**** Correspondents are requested to be as brief as possible. The writer's name is in all cases required as proof of good faith.*

Did Dr. Hayes reach Cape Lieber in his arctic exploration of 1861?

THIS question has given rise to much controversy of late years; and, for the sake of truth, it is highly desirable that it should be satisfactorily answered, although this could only be definitely done by the discovery of the cairn, with its enclosed statement, deposited by Dr. Hayes at the highest latitude reached by him.

The writer believes he can throw some little light on the question, from the fact that he had the original records before him, worked up the astronomical observations (Smithsonian Contributions to knowledge, No. 196, February, 1865), and constructed the chart of the expedition, under the doctor's immediate direction, from the materials prepared by him. A tracing of this chart, upon which Dr. Hayes first assigned and wrote the geographical names, and with his signature attached, is still in my possession. It is reproduced in the work quoted above.

The west coast of Kennedy Channel was first seen and remarkably well outlined by Morton, of the Kane expedition, in June, 1854, and has since been passed and repassed by many explorers: we may therefore take, for the purpose of comparison and reference, the latest excellent delineation as given on the chart (No. 962) issued by the hydrographic office of the navy, in February, 1885, and which is supposed to embody our best geographical knowledge within its region.

We shall first collate Dr. Hayes's narrative ('The open polar sea,' New York, 1867) with this chart, and see where this will land us. The dates of this part of the narrative are unfortunately very scanty, and need identification in order to trace the progress and position of the party from day to day. Dr. Hayes reached the western coast of the Kane basin May 6, 1854, while a member of the Kane expedition, at or near Cape Frazer, in latitude 79° 45′. Page 336 (of the narrative) he says, "Our camp was made near the farthest point reached by me in 1854." This was on May 14, 1861, as identified by me by means of the astronomical latitude recorded for that day (p. 20 of the 'Physical observations,' etc., of the Smithsonian publication). The resulting latitude, 80° 06′, appears, therefore, too high in comparison with our chart. Dr. Hayes there found his old flagstaff still standing, and remarks, 'We were now within Kennedy Channel,' and is struck with the circumstance (p. 339) that no land was visible to the eastward, as he could easily have seen fifty or sixty miles in the clear atmosphere; here he concludes that Kennedy Channel must be much wider, and assigns to it a width of over thirty miles, when in reality it is but twenty nautical miles. He was then fully forty nautical miles south of the entrance of the channel (which is at Cape Lawrence), and looked out on the Kane basin, instead, as he supposed, toward the eastern shore of the channel.

Here, then, at the very outset, we meet with what we must now regard a mistake, the influence of which may have injuriously biassed his judgment as to the extent of his further progress. The next day (May 15) his strongest man, Jensen, broke completely down, and was left at Jensen's camp. This is south of Scoresby Bay, since this deep bay (p. 343) was passed on May 16. On this day he believed himself to be in a higher latitude than Morton had reached, which was about 80° 30′. On May 18 he appears to have been in the vicinity of Cape Collinson. Apparently no mention is made, in the narrative, of the crossing of Richardson Bay; but on May 18 he was finally arrested by a large bay, twenty miles in length (pp. 346–348). This, according to our chart, could have been no other than Rawlings Bay: here its southern cape, known as Cape Good, in latitude 80° 16′, would consequently mark his highest point reached. Between Rawlings and Lady Franklin bays there is no other long bay. That named after Carl Ritter is apparently not over two or three miles in length; and Lady Franklin Bay does not fit the description of his highest bay, inasmuch as its head could not be seen from Cape Lieber, not even the point where the bay divides into two long fiords. This comparison, then, would lead to the conclusion that he never

entered Kennedy Channel at all, and that his supposed Cape Lieber was in reality Cape Good, always provided that our comparison chart is fully to be trusted.

Opposed to this conclusion of a material contraction of the route, we have, in the first place, the explorer's own assertion on the spot, and he ought to know how far he had gone. The paper placed by him in a bottle buried in the cairn gives his highest latitude as 81° 35′ (p. 351 of the narrative), — an opinion to which he ever afterwards strenuously adhered; secondly, we have his chart, with his track extended to the southern cape of Lady Franklin Bay, and which is supported by his astronomically determined latitude on May 17, at Farthest camp, in 81° 31½′ (see p. 20 Smithsonian publication). Those who believe that he fell short of his asserted position must discredit this last observation. Indeed, the comparison of the result of this latitude observation with the next one, which gave the latitude 79° 58½′ (*ibid.*, p. 20), taken May 20, on his return, the day after he left his highest point, has furnished material for criticism (by Dr. Bessels), as it appeared incredible that so long a distance should or could have been traversed in a single day. Yet we should remember that arguments based upon speed alone are rather treacherous: thus it took Hayes forty-six days to reach his highest point on the outward trip, and but fifteen days to return thence to the schooner. It is true he had to carry a heavy load when setting out; but this is compensated by the retardment due to physical weakness of the party, both men and beasts, during their return. No journal was kept by the leader on the home-trip, his whole energy being required to save himself and party; and his prostration was such, that he lost the day of the week by one (as he stated to me), and had to recover the date on his arrival on board ship. He also had the misfortune of having his chronometer run down during a prolonged sleep when near his Cape Lieber.

It is not surprising, that, under these circumstances, his observation at Farthest camp should be defective; but it is particularly unfortunate that he left no means of knowing how he determined his meridian, his practice being to observe but a single altitude of the sun. It is highly probable that the observation was made with the sun in some other vertical than that of the meridian, hence was at a lower altitude, and consequently gave an abnormally high latitude for his place. May he not have estimated the time of the meridian passage, and mistaken the direction of the north and south line? It is noteworthy that he greatly misplaced the direction of the western shore (and axis) of Kennedy Channel, which is about N. 30° E., while his chart makes it trend nearly due north (N. 5° E.).

It may be asked, How could Hayes locate on his chart, with approximate correctness, the western shore-line as high as 82° 15′ (Cape Union), supposing him to have been unable to cross Rawlings Bay? To this it might be replied, that this shore had already been traced by Morton up to this northern limit (see chart in vol. i. of Kane's 'Explorations,' Philadelphia, 1856).

Without pretending to give a conclusive reply to the question at the head of this article, I shall content myself with having pointed out the nature of the difficulties which beset it; and, while the balance of probability seems to point to a decision unfavorable to the claim, I entertain the hope that some future explorer may discover the rough but sufficient monument by which alone a positive and just decision can be arrived at.

An extract from Lockwood's diary, given on p. 95 of *Science*, No. 156, stating that he, as well as Dr. Pavy and Major Greely, agreed in the opinion that Hayes never reached Cape Lieber, induced me to examine the subject anew, with the result as given above. CHARLES A. SCHOTT.

Washington, Feb. 7.

An open letter.

Prof. SIMON NEWCOMB, *President of the American society for psychical research.*

DEAR SIR, — The writer of the accompanying communication has misapprehended the function of the Society of naturalists: but the phenomena he describes fortunately fall within the purview of the association over whose deliberations you preside, and I therefore commit it to your hands.

Very respectfully,
G. K. GILBERT.

Mr. G. K. GILBERT, *President of the American society of naturalists, Washington.*

For the good of science, and in the interest of humanity, I address your worship, entering at once upon my subject.

At the meetings of a spiritualistic society, the members of which bear an unimpeachable character, during the course of about three years of daily experiments by means of the spirit-table, the self-called spirits that were evoked have dictated a treatise, and now demand that it be given to the press, and bear the title 'Spiritualistic apocalypse,' asserting that such publication is necessary for humanity.

In this dictation it is established and explained, with marvellous clearness, learning, and scientific language, what is 'power' and what is 'force,' and how these two perform their functions in harmony through eternity and through space. Next there is established the fact of a living magnetic current, which will give occasion for new discoveries, and a metaphysics of social harmony, with absolutely new arguments, on which it will be well for society to reflect seriously. Moral science is lighted up in its true profile, and not from the utilitarian side. Religions are placed in the position which they deserve, and indirectly the true religion is pointed out. There are weighty political prophecies; one of them, a very beautiful one, having been dictated by a spirit who said he was General George Washington. There are useful counsels for organic social reforms, learned astronomic communications, and surprising explanations of fundamental theologic philosophy. Physics, chemistry, and algebra are largely, and with critical judgment, employed in the development of the theorems thus established. There are instructive dialogues and trilogues among spirits of diverse nature and degree, but identical in substance. Finally, the virtual necessity of the why and how of their existence is explained. This, in brief, is what the self-called spirits have dictated, and what they wish humanity to know.

My companions and friends, before publishing this collection, in order to have some fact that might induce persons to read it and reflect on it, under the influence of a firm assurance that it is not the offspring of our own minds, have asked the dictating spirits' permission to invite other experimenters to