

Sensations in a Balloon.

The question "Are you not dizzy in looking down from a balloon?" was answered awhile since by the *Boston Journal* as follows: "Dizziness or giddiness is something entirely unknown in aeronautic traveling, and therein is one of the most surprising facts of ballooning. You look downward with the same steadiness and composure with which you look off from a mountain top. Another strange feature is that the balloon seems to stand perfectly still. Common sense teaches you that you are moving when the distance between you and certain objects is widening, but there is no other indication of the fact, nor is there in rising and falling in the atmosphere. Immersed in the air current, and traveling at the same or nearly the same velocity, the balloon seems relatively becalmed.

This fact, the *Journal* goes on to say, sufficiently explains the utter uselessness of sails and rudder. There is no wind to fill the one, nor fulcrum or resisting force for the other. The only power of a gas balloon is its buoyant force, and thus all inward efforts at propulsion or control, beyond a simple means of rising or falling through a depreciation of the buoyant material or the ballast weight, are manifestly fruitless. Until some other inward motive power than mere buoyancy is devised, no forward step can be made in aerostatics, and the union of any other with the gas balloon is entirely hopeless, since the craft is wholly at the mercy of the element which sustains it. The wind currents, too, are so variable that navigating the air between given points under their control would be quite as much out of the question.

No difficulty is experienced at a less height than two or three miles, by persons in health, nor is any other decided sensation felt under ordinary circumstances. There may a slight ringing or closing of the ears with some persons in a less altitude, but in the upper regions a deafness is experienced. At the height of three and a half miles the atmosphere is known to have just half the density it has at the surface, and there is, of course, the corresponding decrease of atmospheric pressure. At the surface, a man of ordinary size is said to sustain an atmospheric pressure of 25,000 pounds, while at the height named it is reduced one half, the change bringing with it many discomforts. The reduction of atmospheric pressure is felt by the balloon through the expansion of the gas and the distention of its envelope, and thus to rise to great altitude necessitates an expenditure of the gas, as well as of ballast. To guard against a too sudden expansion of the balloon, the open neck at the bottom serves as a sort of safety valve, while it also becomes necessary to let out gas at times through the valve at the top.

Exploration of Central Asia.

At the last meeting of the Royal Geographical Society, London, Sir Roderick Murchison said the attention of the society had been strongly drawn of late toward Central Asia, and particularly to the vast regions which bordered the north-eastern and northwestern frontiers of British India. The principal region in the northeast embraced the country lying between Assam and Szechuen, the most westerly province of China. A warm desire was expressed by a committee of the British Association, as well as by the Council of the Geographical Society, that that intervening space of about two hundred and fifty miles only should be explored, in order to ascertain if there be practicable passes through the high mountains and wild tracts which separated the upper waters of the Yangtse-kiang from the Brahmaputra at its great bend near Sudiya. Although as yet no positive effort has been made to solve the important problem, the Indian authorities are making efforts to open a route of traffic along a more southerly line between British Burmah and the great Chinese province of Yunnan, now essentially independent of Chinese rule, and most desirous of establishing a trade with our settlements on the Irrawaddy.

Of still more pressing importance, however, than an acquaintance with the regions alluded to, is an exploration of the vast and unexamined tracts on the northwest, far beyond the tributaries of the Upper Indus, or between Peshawur and Jellalabad on the south, and the centers of trade and population at Yarkand and Kashgar. The main object is to define the physical character of the vast elevated plateau called Pamir, or "Roof of the world," from which the Oxus and Zarafshan take their rise, and from which the lofty chains, the Kuen Lun, the Himalaya and Hindoo Koosh radiate. In 1867, Sir Roderick urged the essential importance of such knowledge, to be acquired equally by the Russian and British governments; and he then said that this great table-land or watershed ought to be constituted the neutral ground between the two empires, and to be considered as a broad zone to be forever interposed between eastern Turkestan—toward which Russia has now advanced—and the most northern limits of our Indian possessions.

With a view to taking a first step in this desirable exploration, the Council of the Geographical Society sent out last spring a practiced traveler, Lieutenant Hayward, to traverse this region from Peshawur.

Wooden Railways.

The feasibility of laying wooden railways in districts where the traffic does not require a high rate of speed, and where there is an abundance of hard and durable timber, has been recently made the subject of discussion by our Canada exchanges, and by letter we are informed that the method is proposed for Australia, a kind of timber being found there which is very hard and particularly adapted to the purpose. A. M. F. P. Mackelcan, in a communication to the *Perth Expositor*, gives a favorable opinion as to their utility based upon practical experience.

The cost of such railways being so much less per mile than

those of iron, the shortening of distances by deep cutting or filling is obviated. The natural features of the district through which it passes can be complied with. The low rate of speed renders the erecting of very expensive bridges unnecessary, and as light locomotives only are proposed, the wooden rails are sufficiently strong for perfect safety.

In many parts of Canada, movements looking toward the construction of such roads are on foot, and an exchange informs us "that \$96,000 have been voted by different interested townships in aid of the Toronto, Grey, and Bruce Railway, and the Toronto City Council has passed a by-law granted \$250,000 for the same purpose. These sums, it must be borne in mind, are bonuses in aid of the road."

The *Kingston News* says that among the notices of application to Parliament appearing in the *Official Gazette*, is one relating to a wooden railway from Kingston to Loughborough and adjoining townships. "The projected railway is destined to be realized as a fact, and will prove the adaptability to the wants of the back townships of Canada. The people of Kingston are of course very much interested in the success of an enterprise so well calculated to improve the fortunes of the city, and we feel sure they will do all in their power to promote the passage of the company's charter, and to otherwise aid them in the important work." In many other places these railways are talked about. In his communication above referred to Mr. Mackelcan says:

"I would like to caution those who may patronize or push forward this new system, against making things too great and too grand, under plea of suiting the future, for in this way the present and the future are both destroyed. That which will help Canada to grow into a thickly peopled, well cultivated, and prosperous country, is a net work of cheap conveyance, created in the country by its own industry and with its own capital, and costing so little as to pay for itself in a few years."

The estimated cost of such roads is from \$4,000 to \$5,000 per mile, which seems to us to be ample. We are inclined to think much more favorably of these practical ideas than the visionary project of a British American Inter-oceanic Railway, alluded to by us in a former number. We hope the plan may be well tested, and feel quite confident it will ultimately succeed.

GEOGRAPHICAL AND ARCHEOLOGICAL.

Putnam's Monthly, for January, says:

Captain Burton (the discoverer of Lake Tanganyika) has a new book of travels in the press, under the title of "Explorations of the Highlands of Brazil," with a full account of the gold and diamond mines. Also, of canoeing down 1,500 miles of the great river San Francisco, from Sabara to the sea.

THE first complete census of the Cape Colony, South Africa, was taken in March, 1865. The enumeration, which does not include Natal and the Transvaal Republic, shows a total of 181,592 persons of European birth or descent, and 314,789 natives, the latter consisting principally of Hottentots, Kaffers, and Bushmen. From a partial census, made in the year 1853, it appears that an increase in ten years was at the rate of 86 per cent. Unlike other colonies composed of mixed races, the rate of increase was much greater among the native tribes than in the white population. Among the possessions of the colony are 226,000 horses, 250,000 draft oxen, 10,000,000 sheep, and 2,440,000 goats. In the list of productions we find 1,390,000 bushels of wheat, 1,633,000 pounds of tobacco, and 3,237,000 gallons of wine. 75,000 persons are employed in agriculture and 13,000 in manufactures. Two-thirds of the white population and one twentieth of the natives are able to read and write. Including Natal and the Transvaal Republic, thirty-two newspapers are published—ten in the Dutch and twenty-two in the English language.

LIEUTENANT WARREN is continuing his excavations at Jerusalem with equal zeal and labor. He has discovered that the foundation wall of the platform of Mount Moriah, upon which stands the Mosque of Omar, as once stood the Temple of Solomon, was originally 1,000 feet long, and 150 feet high, nearly the length and height of the Crystal Palace at Sydenham. He traced the enormous masses of stone, which are still visible at the southern end, to a depth of 45 feet below the present surface. Behind this wall there are the remains of vast tunnels, arches, and chambers, which Lieutenant Warren refers to the old Jewish Jerusalem, before the time of Herod.

THREE English gentlemen, Messrs. Freshfield, Moore, and Tucker, last summer succeeded in ascending the Elburz, the highest peak of the Caucasus, the altitude of which they ascertained to be 18,526 feet. Since geographers have adopted the axis of the Caucasus, from the Black to the Caspian Seas, as the boundary line between Europe and Asia, and the peak of Elburz lies on the European side of this line, it thus becomes the highest mountain in Europe, exceeding Mont Blanc by more than 3,000 feet.

THE committee charged to collect funds for the French expedition to the North Pole, has published a report, stating that the vessels will be in readiness by the commencement of this year. It is intended to despatch the expedition from France in January, if possible, in order that it may reach Behring's Strait by the end of July.

PETERMANN'S "Mittheilungen" in Gotha publishes a map of Lower California, from the exploration made by J. Ross Browne, Gabb, and Lochr. An account of the journey, with interesting geological details, from the pen of Herr Gabb, is added.

Editorial Summary.

AGASSIZ'S EXPLORATIONS IN BRAZIL.—The geographer Petermann says of Agassiz's "Explorations in Brazil": "The history of scientific expeditions has scarcely an example which, in point of brilliancy and aid rendered from all quarters, can be compared to this journey of Agassiz. It is known that since his settlement in Cambridge, he has received such a recognition and support from the Americans, as a man of science has seldom enjoyed, and it now appears from his work on Brazil, that also in South America all classes of the people united to do him honor. Had Humboldt visited Brazil during the last years of his life, his reception could not have been more splendid."

A GOOD story is told of a merchant whose business is located on the eastern side of the Sierra Nevada. Being in want of additions to his stock he purchased goods in San Francisco and ordered them shipped via the Central Pacific Railroad to its terminus at the time the goods were shipped, supposing that by the time the goods were ready, the road would have progressed nearly to his location. Such progress was made in the interim, however, that the goods were delivered at a point fifteen miles on, from whence they were carted back to their destination.

TO REMOVE SUBSTANCES FROM THE EYE.—To remove foreign bodies from beneath the eyelid, take hold of the upper eyelid, near its angles, with the index finger and thumb of each hand. Draw it gently forward, and as low down as possible over the lower eyelid, and retain it in this position for about a minute, taking care to prevent the tears from flowing out. When, at the end of this time, you allow the eyelid to resume its place, a flood of tears washes out the foreign body, which will be found adhering to, or near to, the lower eyelid.

SMOKE WREATHS.—We are in receipt of several communications in regard to smoke wreaths which we are obliged to pass by. The subject is of little or no practical importance. Such wreaths are caused by friction upon the external portion of a volume of smoke caused by its partial adhesion to the walls of the gun, tube, or aperture through which it is forced. This gives a rolling motion from the center of the volume outward and produces the phenomenon. With this explanation we dismiss the subject.

THE removal of Union College from Schenectady to Albany, N. Y., and making it in connection with the Albany Medical and Law schools, and the Albany Observatory, into a State University is strongly urged. It is asserted that if the citizens of Albany will raise \$500,000, the trustees of the College will consent to the arrangement and transfer the entire college apparatus, cabinets, library, etc., and the college endowment, now estimated at one million five hundred thousand dollars.

WE understand that the splendid collection of engineering models, belonging to the late Professor Gillespie, of Union College, Schenectady, has passed by purchase into the possession of that institution. It is probably the finest collection of engineering models and instruments in the United States. The department of engineering is now under the direction of Prof. Staley, a former pupil and assistant of Prof. Gillespie, and a gentleman of singular ability in his profession.

BARON JAMES DE ROTHSCHILD, who died in Paris, November 15, left a fortune estimated by the French papers at \$400,000,000. Most of this is in stocks, money, and portable securities; but he had also splendid town and country houses, the latter close to the Bois de Boulogne; and fifty-one other houses in Paris; palaces at Rome, Naples, Florence, and Turin; and more or less property in nearly every great city of Europe.

OLMSTED'S SELF OILER.—In the description accompanying the engraving of the oiling device in the last issue of the SCIENTIFIC AMERICAN, it is stated that it was patented Jan 21, 1868. That is the correct date of the oil cup patent, but the hollow shaft patent was issued as long ago as May 2, 1865.

AN eastern professor states that the meteoric showers of the last two years were occasioned by the tail of a comet which passed in 1866. He estimates the flow as being 200,000 miles per day, and that it has been nearly three years in passing. Truly this is a stupendous tale.

A NEW method of attaching the soles of boots and shoes to the uppers has been patented. Copper wire is used for stitching instead of the ordinary shoe thread. It is claimed that superior strength is gained by this method, with but a trifling increase in the cost of the work.

A KENTUCKIAN writes to the *Northwestern Farmer*, that of a lot of telegraph poles put up in Kentucky, the chestnut rotted first, the cedar gave way next, the locust stood five years longer and are still nearly sound.

A YOUNG writer having asked the *Petersburg Express*, which magazine would give him most speedily the highest position, was advised by the editor to contribute a fiery article to a magazine of powder.

IT is stated that the Czar of Russia has sent two engineers to inspect the Pacific Railroad, with a view to utilizing whatever information they may obtain in the construction of a road from St. Petersburg to Chinese Tartary.

A SINGLE establishment in Vermont turns out 100,000 slate pencils per day. How many little fingers and young brains they must keep busy.