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VII. *Account of a fatal Accident which happened to a Traveller on the Glacier of Buét; with some Cautions to those who through Curiosity may visit the Mountains of Switzerland, and particularly the Glaciers.* By M. A. PICTET, *Professor of Philosophy* *.

A SENTIMENT of curiosity, exceedingly natural, induces travellers from all parts of Europe to visit Mont Blanc, the highest point of the old world, and to examine the surrounding glaciers. Since the memorable ascension of the learned historian of the Alps, these places have acquired a new degree of interest: the geologue, the mineralogist, and the mere amateur repair thither with avidity; and even women are amply indemnified for the fatigue of the journey by the pleasure arising from the view of objects entirely new to them, and by the amiable and friendly reception they meet with from the inhabitants. Every thing unites to make this excursion, which is attended with no real dangers, the usual object of all curious travellers who visit Geneva and its environs.

The more this journey presents attractions, the more it is of importance to make known the dangers to which travellers who undertake it may be exposed merely by imprudence or inattention. Our principal view is utility, and without doubt it is of utility to make known, in all places where this journal may circulate, dangers which are indeed great to those ignorant of them or who forgot them, but of little importance to those who are forewarned or cautioned to avoid them. Had we treated this subject some years ago, the fatal accident which lately took place, and to which we were almost witnesses, would not, perhaps, have happened. This reflection will not allow us to hesitate any longer. The experience I have acquired by travelling among the mountains, either when accompanying my illustrious friend Saussure, or in ten journeys undertaken to the glaciers of Chamouni in particular, will perhaps entitle me to some confidence from those whom I am desirous of saving from uneasiness or

* From *Bibliothèque Britannique*, No. 112.

danger :

danger: I shall, however, refer to the end of this article the cautions in this respect which have been suggested to me by experience, and shall proceed to an account of that event which induced me to take up my pen on the present subject.

C. d'Eymar, præfect of Leman, an enlightened lover of the arts, and a passionate admirer of the beauties of nature, having lately proposed to visit the glaciers of Chamouni, a canton which at present forms the eastern boundaries of the department under his administration, invited me to accompany him; and I readily embraced his obliging offer. We set out on the 7th of August, and slept the first night at Sallanches, as travellers do in general.

Next morning, during our first hour's march, we met a young man on foot, accompanied by a peasant who was carrying a valise. We were struck with the melancholy and dejected air of this peasant. When we arrived at Servoz, three leagues from Sallanches, we learned from Deville, a very intelligent and experienced guide who attended us, that the morning of the day before, a stranger, the companion of the young man we had met, being with his friend and a guide on the glacier of Buet, had suddenly disappeared, at the distance of some paces before them, in a crevice of the glacier covered with snow, which had given way under his feet. When they reached the mouth of the crevice, the bottom of which they could not perceive, the two survivors called out a great number of times, but in vain, to their unfortunate companion swallowed up in the abyss; and they did not quit the place till they had lost all hope of his safety. M. Zimpfen, the young man whom we met, when he arrived at Servoz, had given Deville a commission in writing, to endeavour, if possible, to discover the body of M. Eschen, his friend, and to cause it to be interred.

As scarcely twenty-four hours had elapsed since the event, the sensible mind of d'Eymar was struck with a ray of hope, and he immediately and officially enjoined Deville (for he hesitated, and not without reason) to furnish himself with the necessary means, to set out in the utmost haste, accompanied by such a number of men as he presumed might be necessary, and to give him an account of whatever should be the result.

result. It was at least a journey of nine hours from Servoz to the glacier in question; and as this glacier did not form any part of those we intended to visit, it was impossible for us to be informed of the issue of the proposed search till we passed Servoz on our return from Chamouni, to which we continued our route not without dejection.

It is with regret that I am obliged to omit the details of the stay we made in this interesting valley; they have a character which will always be imprinted in my remembrance, but they would be foreign to the present object. However, while the brave Deville and his companions are engaged with their enterprise, I shall venture to suspend the impatience of my readers for a few moments in order to make them acquainted with the glacier of Buet, and the motives which might induce travellers to visit it.

It is to Messrs. De Luc, the two brothers, that philosophers and naturalists are indebted for discovering the possibility of reaching this summit covered with eternal snow. It is an insulated mountain situated in front of the central chain to which Mont Blanc and its glaciers belong, and separated from them by a lower chain that runs in a parallel direction. This glacier may be seen from Geneva immediately on the left of the Môle. It appears under the form of a ridge not very salient, and which seems to be easy of access. Messrs. De Luc were, however, deceived in this respect, and the account of three attempts they made to reach it, the last of which alone, on the 20th of September 1777, was attended with success, is one of the most interesting episodes to be found in the works of any naturalist. It was a desire to discover the law which the decrease of heat in boiling water follows in proportion as it is raised in the atmosphere, that induced them to visit this mountain, and to brave, three different times, difficulties and dangers of various kinds to which they were exposed in attempting to reach a summit that may be considered as the utmost possible boundary of philosophical observation. Honour to that science which inspires courage so persevering, and which produces it in succeeding generations! Our daring countrymen never suspected that, seventeen years after this expedition, Saussure would

would repeat their experiment on Mont Blanc itself, that is to say, about 850 toises higher than they were able to ascend after great danger and fatigue.

Some years ago, a much easier route for arriving at the summit of Buet or La Mortine (for it is known by that name also) than that followed by Messrs. De Luc was discovered, and by this route I ascended it twice without experiencing any difficulty. You first sleep at Chalets de Villy, the last place of pasture of the valley which begins at Servoz and terminates at the glacier of Buet. From Villy you proceed to the Col de Salenton by a path practicable for mules; you then encounter the mountain on its eastern and southern sides, and, passing alternate declivities of snow and slate, reach the summit at the end of two hours and a half. The mean of two observations of the barometer which I made there, and which were very little different in their results, gave me 1594 toises for its height above the level of the sea.

The mountain itself presents nothing very interesting in a lithologic point of view; it consists of slate intermixed with veins of rotten quartz, or quartz similar to stalactites; but as a belvedere, nothing in my opinion exists that can be compared to it. You here embrace at one view the whole space comprehended between Jura on the west, as far as the mouths of the Rhone on the east, and, on account of this circumstance alone, I considered this mountain as exceedingly proper for receiving signals in an intended measurement of a degree of latitude and two degrees of longitude in the parallel of Geneva; a plan which may be found detailed in a memoir published in the Philosophical Transactions of the Royal Society of London for the year 1791*.

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* I cannot convey a better idea of the situation of this spot than by quoting the words of M. De Luc:—"It is difficult to give a description in words when they do not awaken sensations which have been felt; I do not, therefore, flatter myself with the hope of exciting in the minds of my readers those which I then experienced. The most profound silence prevailed in these regions; we perceived that they were not made for living beings; they were as little known to our guides as to us. The Chamois goats never approach them, and consequently no hunter had ever ascended so far.

"This

In my second journey to mount Buet, I was under the disagreeable necessity of being constantly enveloped by clouds

" This sensation of profound solitude was one of those which we could most easily explain, but it does not explain our situation. We were on an immense extent of snow, the whiteness of which nothing altered. The rays of the sun, reflected in a straight line from the snow towards that luminary, showed us how smooth it was; and this smoothness the imagination extended to every thing around. We saw nothing but this snow, and the heavens, towards which it was terminated in various folds, delicately rounded like those beautiful argentine clouds which are sometimes seen floating majestically in the pure atmosphere. This was exactly what produced the extraordinary sensation which we then experienced. We actually thought ourselves suspended in the air on one of these clouds.—And what kind of air? Never had we before seen it of such a colour. It was blue, dark and bright at the same time, which produced an inexpressible sensation of immensity.

" It was near noon when we arrived; and, on raising our heads above the veil which so long concealed from us the eastern part of the horizon, we suddenly discovered the immense chain of the Alps in an extent of more than fifty leagues. On whatever side we turned our eyes, the whole horizon was covered with mountains. Its boundary on the west was nothing but the thickness of the air; for we overlooked the chain of Jura, distant about thirteen or fourteen leagues, so much that we could have seen the plains of Franche-Comté and Burgundy, if the air had been sufficiently transparent. On the south-west our view extended as far as Mount Cenis, and on the north-east probably as far as Saint Gothard. We were far raised above all the defiles of the Alps, and only a few of their peaks were elevated above us.

" In all this vast space, where mountains were accumulated on each other, we could discover no plain but in a small corner to the west, the middle of which was occupied by Geneva; and on the north-east we saw, almost from one end to the other, the large valley through which the Rhone flows, from the place where it falls from the mountains, as far as Sion, the capital of the Valais, distant from the place where we were nine or ten leagues. All the rest was filled with mountains.

" The details as well as the *ensemble* would have excited the attention of the most indifferent beholder. A single view of the immense quantity of ice and snow which covers the Alps will be sufficient to satisfy the spectator respecting the duration of the Rhone, the Rhine, the Po, and the Danube. It inspires us with an idea that this is their common reservoir, and that it is sufficient to supply them with water during several years of drought. We compared, without having need of calculation, their streams with their sources. These sources appeared to us only small

clouds during the six hours I remained on it. I was exceedingly cold, and, in order to warm ourselves, I and my guides were obliged to construct a hut on the ridge of rocks nearest the summit. We had at hand large pieces of slate, and our building was so solid that it still exists, and has sheltered more than one curious traveller from the severity of the weather.

The glacier, which covers this summit, differs from the greater part of those accumulations of ice known under that name in this respect, that the latter generally occupy the valleys, or the defiles in which the ice has not been originally formed, but to which it has sunk down by its own weight, and the pressure of the ice above it; whereas the ice of Buet has been formed in the place where it exists; and at that height in our parallel the snow never melts in summer. This mountain, therefore, may serve to determine with some precision the lowest boundary of the snow in our climates.

Thus, for example, by observing from Geneva, through a telescope furnished with a micrometer, the vertical angle comprehended between the summit of the glacier and the lowest boundary of the snow, I found it to be $16^{\circ}14'$, which, taking the distance of Buet from Geneva at 29820 toises, corresponds to 141 toises, the distance of this boundary below the summit, which places it at 1453 toises above the level of the sea.

It may here be asked, what is the mean annual temperature at this height in our latitude? We have pointed out somewhere in our Journal a very simple formula, which Saussure deduced from a great number of observations, and which represents very well the law of the decrement of the mean heat of the atmosphere from the bottom upwards. This decrement is a hundredth part of a degree of the thermometer of Reaumur per toise of perpendicular elevation. This for-

rills, when compared with the valleys filled with ice, from which they flowed. Mont Blanc, which rose above these valleys, seemed capable of furnishing alone, for a long time, a sufficiency of water for a river, so much was it loaded with ice from the top to the bottom; that is to say throughout a prodigious extent.—*Recherches sur les Modifications de l'Atmosphère*, vol. ii. p. 399.

mula,

mula, therefore, applied to the mean temperature at the level of the sea, in the parallel of 46° (the latitude of Buet), as established in Dr. Kirwan's Work on the Temperature of the Globe, viz. 56.4° of Fahrenheit, or $10^{\circ}.8$ of Reaumur, will give for 1453 toises 14.53 degrees to be deducted; which makes the mean annual temperature of the lower boundary of the snow, in that parallel, to be 3.63 degrees below zero .

It is not surprising, therefore, that this mountain should be crowned with a glacier, since the snow which falls there during the cold season, never entirely melts in the summer. The water produced by the partial melting of the surface of the snow filters through the porous snow beneath it, and freezing in its interstices gradually converts it into ice. In this manner is formed an accumulation, the thickness of which M. De Luc endeavoured to estimate from the following observation :

"We judged," said he, "by the position of these small rocks, about 200 feet lower than the highest part of the ice, that they formed a part of the real summit of the mountain. The whole mass above them was nothing but ice, in the form of a cone, cut through its axis, 200 feet in height, with a very extensive base, and resting on the im-

* I had occasion not long ago to discuss this formula with a philosopher, who observed to me, that, according to its nature, it was impossible it could be correct; because the density of the air, an element on which the preservation of heat in the different strata of the atmosphere essentially depends, decreases in geometrical progression; while the heights in toises, which represent the temperatures, proceed in arithmetical progression. I admitted the justness of the observation, speaking mathematically; but, in a physical point of view, as the formula is composed of co-efficients, some of them unknown or inappreciable, which gives to the temperature an arithmetical progression, decreasing from the bottom upwards, it is no less true, that this formula, however deceptive it may be, represents the mean results of observations sufficiently well to be employed with convenience, when an approximative quantity only is necessary: and this was exactly the case. The question was the mean temperature of mount Saint Bernard, the philosopher was Bonaparte, and the discussion took place at table, and even in the apartment of the celebrated man whose theory and calculations I was endeavouring to defend.

menſe extent of permanent ice, which covers the whole declivity of the ſummit.”

But I learned, not without ſurpriſe mixed with horror, by the event, of which I am going to give an account, that this glacier, ſo often viſited by travellers, and which I twice traверſed myſelf with perfect ſecurity, contains ſome of thoſe ſiſſures, covered with ſnow, which renders others dangerous when the proper precautions are not employed.

During our ſtay at Chamouni, C. d'Eymar having heard that the guide, who accompanied the unfortunate Eſchen, reſided ſomewhere in the valley, ſent for him, to learn the particulars of the accident. When he arrived, deſpair was ſtill painted in his looks and whole countenance; but we learned nothing from him that we did not before know. He was a guide, ſelected by chance, who ſeemed to be little acquainted with the mountains, and who, however, as he told us, had requeſted M. Eſchen, when they arrived at the glacier, not to ſeparate from his two companions. Hurried on, however, by that undefcribable ſenſation which people ſometimes experience when they reach high ſummits, and obſerving at the top of the glacier, a little diſtance before him, two chamoy hunters, who were reſting themſelves, he hurried forwards to join them; and it was then that he diſappeared.

We ſhall now return to our narrative. As we paſſed Servoz on the morning of the third day, the body of the unfortunate Eſchen was conveyed thither. We viewed it with the liveliest emotion; and by minute inſpection we were convinced that he had not ſurvived his fall a ſingle moment. We were fully confirmed in this opinion by the details which were given to us, and by obſerving that three of the real ribs on each ſide were broken, and that there was a great depreſſion of the ſternum; ſymptoms which indicate that the unfortunate young man had experienced the moſt ſudden and moſt violent compreſſion. The body was no ways diſfigured, and his features, in perfect harmony, excited no idea of his having ſuffered pain. We learned by the paſſport found in his pockets, along with other articles, that his name was Frederick Auguſtus Eſchen; that he was born
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in the bishopric of Lubec, and that he was twenty-three years of age.

[To be concluded in the next Number.]

VIII. *Memoir on the Ibis of the Antient Egyptians.* By
C. CUVIER*.

EVERY one has heard of the Ibis, a bird to which the antient Egyptians paid divine honours; images of which they placed in their temples; which they suffered to wander about unmolested in their cities; which they embalmed with as much care as they did their relations; to which they ascribed virginal purity, and an inviolable attachment to a country of which it was the emblem, and the figure of which the gods would have assumed, had they been forced to adopt one mortal.

No animal ought to have been so easy to be distinguished, for there is none of which they have left so many excellent descriptions, correct coloured figures, and even the birds themselves carefully preserved with their feathers, under the triple covering of that strong preserver bitumen, thick and close bandages, and of strong vases well covered with mastic. Yet among all the modern authors who have spoken of the ibis, there is none but Bruce, a traveller celebrated by his courage and his knowledge of natural history, who has avoided error in regard to the real species of this bird; and yet his ideas, however correct, have not been adopted by naturalists.

After several changes of opinion respecting the ibis, naturalists at present seem to agree in giving this appellation to a bird, a native of Africa, nearly of the size of the stork, with white plumage, and the wing feathers black; raised on long red legs, and armed with a long bent bill, sharp at the edges, indented at the extremity, round at its base, and of a pale yellow colour, and having its face covered with a yellow skin, destitute of feathers, and not extending beyond the eyes.

* *Journal de Physique, Fruëtidor, an. 3.*