who may find himself on the Corridor, and may wish to gain a more extended view over the range by a climb less monotonous and far less fatiguing than the ascent of Mont Blanc by the Mur de la Côte.

An Ascent of Ararat. By G. Percival Baker.*

TRAVELLING last year with my father through Persia and the Caucasus, we arrived at Tabreez, and there, in concert with two friends, arranged to attempt the ascent of Ararat. With some difficulty we managed to get made some rough alpenstocks, and providing ourselves with small hatchets and very large thick felted socks (which we put over our boots when the footing was slippery, and transferred to our hands when protection for them became necessary whilst we were clambering amongst boulders), we journeyed on to Kumarlu, a junction post-house on the military road of Armenia, between Tabreez and Erivan, whence the base of Ararat is distant about 35 versts, where we arrived on September 3. We set to work at once to secure a guide and horses, and to obtain what information we could about the mountain, so as to judge of the probabilities of success. We heard the same objections to the attempt as we did at Tabreez; but these were mainly repetitions of the well-worn tradition that no mortal could ever reach the top. The old Armenian post-house official, full of prejudice and superstition, was especially foremost in denouncing it most strongly as an impossibility. For guide, one Boghos, of most honourable repute (which we afterwards found was far from merited), was engaged, and he managed to find us horses, a matter of very great difficulty, as they were out on the plains at harvest work.

The next morning (September 4) we started again, and passing through the village to the right of the post-house, we turned a sharp corner to the left, and entered a track leading to the Araxes river, which we were obliged to ford, and after going through a bog of reeds, we had in view, some 3 versts to the S.W., Aralyk, the Cossack station, and the starting-point

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* The following account of an ascent of Ararat seems worthy of insertion, even after Mr. Bryce's recent narrative, as it shows that the mountain is accessible to any traveller with good legs and pluck, and also what risks are run in the descent by such travellers, if they are not mountaineers. Half the climbers of Ararat have come down it faster than they intended, and it is more from good fortune than anything else that they have all come down alive.—Editor.

for the ascent. Our interpreter, Georome Realimi (whom Valentine Baker made famous in 'Clouds in the East,' and George Forbes in the 'Times' during the late campaign), was sent in advance with our cards, as we had omitted to provide ourselves with letters of introduction to the commanding officer at this station, and when we arrived we were most hospitably received, the Colonel entertaining us at mess, and the Major placing his bedroom at our disposal, and offering us all possible assistance for our enterprise. The first step towards our arrangements was to go on the roof and view the mountain, and hear what the officers had to say on the route to be taken. They all insisted that the ascent ought to be made from the south end of the chasm opposite; but this seemed an impossibility, for the course appeared to be up a series of perpendicular walls, capped by a long cornice of ice, some 80 feet thick. The air was so clear that distance was very deceptive, the mountain appearing but 4 versts distant, when in reality 25 versts away. My father was much inclined to try the northern side, where the slope is more gradual and terraced, in spite of its being long and tedious; but before coming to a decision, at the suggestion of the Major, we sent for an Armenian, Sirkis Simonovitch by name, from a village at the foot of the northern slope, and some 20 versts away, who had accompanied a 'Nemsa' (German) party some twelve years previously in an ascent of the mountain. He turned up towards evening, a worthy old patriarch of about seventy years, displaying on his breast as a proof of his ascent a large silver medal of some Russian order of merit, having on one side the bust of the Emperor Nicholas, and on the other his own name. From him we gathered that we must make for Sardarbular, in the pass between Great and Little Ararat, but as to our prospects of success he could say nothing beyond 'Allah belier' —'if Allah wills it.' By eventide all arrangements were complete for starting on the morrow. Provisions were secured, with a skin of vodka for the Cossacks (of whom we were to have twenty as an escort), and by the kindness of the Major we were provided with good artillery horses, in lieu of the more doubtful animals which Boghos had obtained at Kumarlu for us, the latter being returned to their owners.

We were up early the next morning (September 5) expecting to find our party ready to proceed; but our easy-going Russian friends were not to be hurried, and it was nine o'clock before our cavalcade got under weigh, the regiment being paraded to witness our departure. We mustered in all thirty horses, including the five pack-horses loaded with the provisions,

fuel, &c., and the camp wolf dogs followed; the Cossacks were fully equipped, and some armed with the Winchester repeater rifles taken from the Turks in the late war.

Our course was westerly, gradually ascending toward Aghuri, 'the stable,' a small pastured spot on one of the numerous hills (which in the distance look like so many buttresses to the mountain) and near the Great Chasm. Here were pointed out the stumps of the trees marking the site of the old village, and the ruined monastery in a hollow, destroyed by the earthquake of 1848. Halting shortly before midday at the stream which flows from the supposed glacier in the chasm, we purchased a sheep for about five shillings, killed it on the spot, and on arrival at the village a little higher up, regaled ourselves with soup and 'kabobs.' The easy mode of travelling adopted by our friends made us impatient; however, by 2 P.M. we proceeded on our way along the mountain side S.S.E. towards the neck of the Takjaltu (the largest of the beforementioned buttresses), some 7,500 feet above sea level, and as we pursued our way over the ridges there was plenty of partridge shooting.

Our route became now steeper, and rounding the mountain to the right—with Aralyk almost out of view—we had in sight, some distance to W., the pass, with its sloping green plain stretching a mile from the foot of Little Ararat, on our left, to the ridges of the Greater Ararat, on our right. At this point the Major deemed it advisable to send in advance our Armenian patriarchal guide, to inform the Kurds encamped on the slopes ahead of us of the object of our visit, and to request them to provide fodder for the horses. The effect upon this tribe of such a cavalcade, without previous notice of our peaceful intentions, might have frightened them away, so we were told, as they acknowledge no government, and make this junction of the three frontiers a convenience for avoiding payment of taxes. We waited some time on this rough path to the plain to examine a number of trenches some 7 feet deep, at that season of the year deserted, but in winter covered with boughs, and used by the Kurds as refuges for themselves and cattle. It was only towards sunset that we advanced again, arriving soon after at Sardarbular ('the fountain, or spring, of the sardar, or general'), where we found the Kurds very anxious to persuade us to go on farther, telling us that they could not supply our wants, but evidently fearing that there was more in our expedition than an ascent of Ararat. Giving them to understand, however, that our intentions were firm, and inducing them by offers of 'backsheesh' to provide what

we needed, our bivouac was fixed some 30 yards above the spring, and without any bustle, and with all the appearance of everyday life, the quiet Cossacks very soon had a good broth prepared, with the usual tea beverage to follow. The Kurds, being pacified, brought from the valley below a good store of hay, very thin flat bread-by-the-yard, butter, cheese, and thick sour milk, a capital and cooling beverage in hot weather, which we scarcely relished however under these circumstances. By 9 P.M. we all turned in, leaving five Cossacks patrolling the camp, guard being relieved every two hours; the fire was kept up all night, dried dung in cakes being used as fuel. The scene was extremely picturesque as we lay in groups on the ground, the camp-fire burning in our midst, and the snow-capped cone standing out boldly in the brilliant moonlight. The Colonel at the station had been kind enough to lend my father a grand fur-lined cloak with a hood, but had forgotten that he was unaccustomed to vermin, which turned out *en masse* to do justice to the stranger, and the consequence to him was a very restless night.

As usual, there was no getting the Major to move off early the next morning (September 6). The Yevash! Yevash! system of the Turk was as prevalent on this side of Ararat as on the other; however, it gave us an opportunity of rambling about and making such observations as give life to a trip of this kind—for instance, we had a stroll down to the spring, where we were much amused by a display of coquetry on the part of a Rebekka, the only drawback being that she spoke an unknown tongue, and then we had a display of very business-like qualities on the part of the male members of the tribe, who made us pay dearly for some tent-rugs, such as are used in the West as *portières*, and socks which we purchased of them, and charged us double price for our second sheep. About ten o'clock the horses for the climbing party were saddled, and orders having been given to the Cossacks who were to remain and protect our camp, we proceeded on our way, taking only four Cossacks with us. Our Armenian guide led us to the N.W. corner of the plain, and then, following the course upwards of the then dried-up stream, we crossed many hills and dales, and by 12.30 decided to give up the horses and proceed on foot. By 1.30 P.M. we had reached a height of about 9,000 feet, and entered a pastured hollow, the head of which, to the left of the stream, was bounded by a precipitous mountain stretching across this side from S.W. to E. Up this I climbed—whilst my friends were searching for a spring—starting from a plain to the left of that

we were in, and from the top had a grand and commanding view. Bayazid was to be seen to the S.W., with the infant Euphrates taking a serpentine course past it; the Little Ararat, in perfect conical shape, was to S.E., with its streaky grey lines running from top to bottom, and below in the hollow was a perfect volcanic crater. Here I was able to signal to my friends; and after a scramble of an hour over these rough boulders I returned by 4 P.M. The spring had been discovered on the left side of the water-course, and very near the gorge leading to the second small valley just mentioned. All preparations, much to my astonishment, were being made for our second night's bivouac, and I protested strongly against this, knowing well the task laid out for the morrow would be certain failure from so low a height. We decided therefore to start at once, with the Armenian and two Cossacks to carry provisions and my father's coverings, leaving behind the Major and Georome to follow later with partridges, which they were then cooking.

Crossing the water-course we struck in a N.E. direction for the first ridge. Climbing soon became very laborious, though not dangerous, especially on account of the heavy burdens which we had corded tightly to our shoulders. The spur gained, we continued on its other side, with another ridge running parallel to us, and beyond yet another and the last—a castellated one, which runs in a gradual and long slope from its 'keep' or projecting spur, Tash Killissa, to the S.E. side of the pass. On this second ridge, at a point perhaps some 12,000 feet high, with a fast setting sun, we found a sheltered nook, some 6 feet long by 5 feet wide, with a rock bottom, and protected on three sides by rocks some few feet high. We had had the usual daily shower, and this, with the intense cold as the sun waned, made one shiver at the sight of a cold stone bed. However, the best was made of the occasion by spreading out our macintoshes, yorgans (cotton-wool quilted counterpanes), and yapangees (a clodded goat-hair Cossack cloak) to sleep upon, and, feeding on 'Liebig,' with a few biscuits, we four laid down together, being tightly wedged in this small space, and having all to turn at the same time.

We were astir by four o'clock the next morning (September 7), having had very little sleep, and, as I expected, the Major and Georome with the partridges had not put in an appearance. We accordingly started without them, and leaving our Cossacks to take care of the coverings we were again following the Armenian up the ridge straight against the cone. At eight o'clock my father, one of my Tabreez friends, and the Armenian guide, showed such signs of fatigue that my

friend T—— and I decided to push ahead by ourselves, and by eleven o'clock we reached the last terrace, with a slight hollow (the lowest part of which was covered with hard snow) between us and the rockway at the foot of the actual cone. The length of this terrace from E. to W. was about ¾ of a mile, and as it is at the bottom of the 4,000 feet of snow slope, which here takes a turn westerly, it seems to me very probable that, after a few cold seasons, it would become a perfect glacier.

After crossing this bed of snow to gain the rockway, we found ourselves climbing at an angle of from 30 to 35 degrees, and progress was very slow, for we had to put our thick socks on our hands and scramble on all-fours over immense boulders. At 1.30 P.M. we could just distinguish our party below crossing the ice-slope at the foot of the rockway, and making for the projecting spur or peak ('Tash Killissa'); they had evidently given up the attempt for the summit, and were now endeavouring to reach the most commanding position on this side of the mountain for a view of Ararat plain, extending from Erivan to Djulfa, on the Persian frontier. Resuming our course with a 'yohla' ('en route') from my friend, we had on our right the steep frozen snow-slope, with a precipice on our left, and Little Ararat opposite we now overlooked. Our way became more perilous, the rocks being so large that with great difficulty we scrambled over them. The rarity of the air also began to affect us, and we had to make frequent stoppages to take breath; but T——'s happy 'yohla' spurred us on to further exertion. When we reached the junction of this rockway with another which starts from the S.W., the precipice being between the two, we came upon a piece of wood, 6 feet long by 3 inches thick, fixed tightly in a rock, and then, some little distance away, another piece, about 2½ feet long, with a nail driven through it and a tin plate in the centre. We saw that the two pieces had formed a cross, and accordingly nailed them again into position. Names had been cut out upon the cross-piece, but had been effaced by the weather. The way from this point was in some places wholly covered for a few yards with the frozen snow, in which we had consequently to cut steps, and were obliged to exercise great care in our progress. As it was now nearly 4 P.M. I began to feel somewhat discouraged, but my friend cheered me up by assuring me that he could see that six more rests would take us to the top, although when these six rests were done we had still in reality some three times six to follow. Nearing the summit, we came to a great deal of loose stone, or 'screes,' which, though far from difficult, was tedious work, as at every third step up we would

slip down one, sometimes floundering and fearing that we should come down altogether with a rush. This is the place said by tradition to be on fire, on account of the sulphurous vapours which are said to be sometimes observed there. We, however, noticed nothing of the kind. After passing the 'screes' we had more step cutting to a rock jutting out above us, and then, scrambling on all-fours over this, we were at last, at 5 P.M., on the top of Ararat, at the south-east side, and about 17,000 feet above sea-level.

The weather was very bright, and we could see very plainly the whole extent of this summit, which seemed to be about 300 yards by 250 yards. The rarity of the air no longer inconvenienced us; the wind was blowing a gale from the west, streaking in lines the hard snow top some inches deep, and we thought it prudent to attach ourselves to each other by the rope. Looking with the glass towards the south, we could just distinguish on the plain our pack of horses, which appeared as a small speck. We were unable to distinguish any one mountain from another, but beyond Little Ararat could be seen an expanse of water, surrounded with abrupt peaks, evidently Lake Urumia and the salt plain by Tabreez. There was a slight depression or valley on the top of the mountain, and this we crossed to the N.W., to see which was the higher point, our opinion being that the preference must be given to the S.E. side. The view on this side into Turkey was very indistinct, but we imagined we could make out Kars, Bingol Dagh, Kirzil Tépé, and other places famed since the war. Nearer to the N., Ala Guz, a three-peaked volcano, was prominent, and to the right of it Lake Gotcha. The terraced slope on the northern side appeared to extend gradually downwards for many miles to the plain, and seemed from our point of view to be a comparatively easy, though long, route for the ascent.

Recrossing the summit without a word, and pondering much on the difficulties of the descent that lay before us, but little of the day remaining for its accomplishment, we reached the ridge, and with a 'yohla' started downwards. Instead, however, of steadily retracing our route down the steps we had cut, T—— proposed sliding down the bare slopes on the rock-way, and prepared at once, by putting his alpenstock between his legs to act as a break, to adopt this mode of descent down one of these slopes some few yards long. I condemned this proceeding very strongly, as I feared he would not have sufficient control over his course; but he was not to be dissuaded, and away he started. He worked his way downwards fairly enough

for a short distance, but then, unfortunately, the formation of the slope becoming somewhat irregular, he was carried too far to the left, and the impetus he had then acquired depriving him of his steering power, he was unable to get back. In another minute he lost his equilibrium and his alpenstock, and, rolling and pitching over and over, was soon lost to view. I made all possible haste over the 'névé' to the 'screes,' which I cleared in a few minutes, and then a short glissade, which, however, lost me my alpenstock also, brought me to the rock-point I was making for with a nasty bump. Scarcely daring to hope that I should find any traces of my friend till I reached the bottom of the 4,000 feet of slope, for I knew of nothing to arrest his downward course, and, horrified at the shocking accident, which I feared could only have a fatal result, I pressed on recklessly till I reached some projecting boulders which had obstructed my farther view of his progress, and there, to my great joy, was my friend some sixty paces off, and still alive! The poor fellow, with what little consciousness remained to him, was holding on to some broken frozen snow, which, fortunately for him, had checked his descent; but death stared him in the face, for a slip of a few feet farther would take him again on to the smooth surface, with still 2,500 feet fall before him. As he did not speak, and appeared unable to move towards me, I hastened to put my socks again over my boots, and with my hatchet carefully cut my way to him, and was thoroughly exhausted when I reached him, as each of the sixty steps required five hard cuts before the least footing was available. The poor fellow was in a most pitiable condition, and another 1,000 feet would no doubt have killed him outright; his hands and arms were much cut, the heels of his boots were torn away, and his feet were bleeding; he was bruised from head to foot, and shivering with cold, and all I could get from him was that he wished he were dead. Fortunately, although his flask was broken, the leather covering kept the glass together, and preserved just sufficient brandy to rouse him for the exertion necessary to regain a place of comparative safety.

Our return to the rocky ridge necessitated very great care; but beyond the loss of my pocket-book, which I much regretted, it was accomplished without accident, and our sense of thankfulness was great when we again had a firm footing. It was now about 6.30 P.M., with the sun fast setting, and we were 15,500 feet high; however, with socks on our hands, we pressed on, not as fast as I should have wished, as T——'s right hand was useless, and he had to do all scrambling over rocks with his left hand only. By 8.30 P.M. we were down at the foot of the

cone; and as long as Little Ararat was in view, with the moon to determine our bearings, we hoped we should get down to our friends that night. About 11 P.M., when we were both suffering great thirst, we heard some water trickling, apparently some little distance below, and made for it, climbing with the greatest difficulty over the boulders. These in the moonlight were very ugly and deceptive, their shadows often appearing to be rocks themselves, and causing us in consequence many awkward falls. Down we went, plodding our way over this rough ground for three quarters of an hour, the sound of the water still being heard tantalisingly ahead of us, till we found we had strayed into a small valley, enclosed on all sides, with no outlet below, and, worst of all, the water we had been pursuing could not, when we found it, be reached by hand between the rocks. In a despondent state we climbed out of this place, and endeavoured in vain to regain our route, struggling all the while against an almost overpowering desire for sleep; but now the moon went down, leaving us in total darkness. At length, thoroughly tired out and disheartened, we crept into a small recess formed by overhanging boulders, intending to sleep till sunrise; but the pain of T——'s cuts and bruises deprived him of any chance of sleep, and the intense cold soon obliged us to rouse ourselves and take some little exercise to keep up the circulation. In this way, half awake and half asleep, we passed the dreary intervening hours until we were gladdened by the sight of the brilliant morning star, by the light of which we managed to advance a little, and between 4 and 5 o'clock the day began to break.

With what joy we hailed the return of daylight, especially when it revealed to us the cheering fact that we were in the direct line for the pass! With renewed energy we proceeded on our way, and a little later on we came across the track our friends had taken the previous day, leading along the bed of the dried-up stream to the spring before mentioned. This course we carefully followed, and by 8 A.M. had the pleasure of rejoining our companions, whom we found in a state of great anxiety on our account, and at that very moment preparing to detach a party in search of us. After satisfying our Armenian guide, by our descriptions of the route we had taken, that we had really been to the top, we were warmly congratulated by the Major on our success, and then were glad enough to find a good breakfast ready for us, to which we did ample justice, having been without food for twenty-eight hours. Resuming our course downwards towards Sardarbular, we reached that place about 1 o'clock, and there had to settle accounts with the

Kurds for the provisions and fodder which they had supplied to us. Here we all remounted our horses, and, guided by a Kurd, rode in an easterly direction to a Cossack station called Bouroulan (where the most of the water flowing through the rocks on this side of Ararat seems to collect and swamp the district), and thence, after a short halt, we returned to Aralyk, our starting point of September 4, T—— and I having been plodding along without sleep for forty hours.

Our Russian friends were again most hospitable in their treatment of us, and we took our leave of them the next day with many expressions of mutual regret.

BORDIER'S 'VOYAGE AUX GLACIÈRES.'

The Alpine Club has been fortunate in securing a copy of that very rare work, M. Bordier's 'Voyage Pittoresque aux Glacières de Savoye,' printed at Geneva in 1773. Professor Tyndall, in his 'Forms of Water,' has called attention to this acute and ingenious observer's claims as a forerunner alike of Rendu and Forbes. We shall best aid to do them justice by reprinting here his chapters on a glacier theory, adding a short extract which curiously anticipates the method of modern observers. The remainder of the book is a lively description of a journey by Martigny and the Tête Noire to Chamonix, and the return by Sallanches. The descriptive powers of the author fully justify the epithet used in his title-page. His pictures are drawn direct from nature and still give pleasure. Geneva as it was a hundred years ago—the Geneva of Voltaire and Rousseau—with its forts and bastions, presenting the aspect of a 'ville de guerre,' is vividly placed before us in his pages. To the modern reader, familiar with Professor Ruskin's eloquent chapter on Mountain Gloom, it is amusing to find the 'Bonheur' of the inhabitants of Valorsine specially celebrated, and their lives described as worthy of Arcadia.

Hypothèse sur les différents phénomènes des Glacières réduits à un seul principe.

'Il est tems maintenant de considérer tous ces objets avec les yeux de la Raison, & d'abord d'étudier la marche & la position des Glacières, & de chercher la solution des principaux Phénomènes qu'elles présentent. Au premier aspect des Monts de glace une observation s'offrit à moi, & elle me parut suffire à tout. C'est que la Masse entière des Glaces est liée ensemble, & pèse l'une sur l'autre de haut en bas à la manière des Fluides. Considérons donc l'assemblage des glaces non point comme une masse entièrement dure & immobile, mais comme un amas de matière coagulée, ou comme de la cire amollie, fléxible & ductile jusqu'à un certain point; supposons ensuite que les sommités du Mont Blanc, point le plus élevé des environs, se soyent trouvées couvertes de glace, & voyons ce qui aura dû en résulter.