

ACONCAGUA AND THE VOLCANIC ANDES

BY SIR MARTIN CONWAY

WITH the climbing of Mounts Sorata and Illimani (the culminating points and the northern and southern extremities of the snowy Cordillera Real of Bolivia), and with the inspection and survey of the intervening range, the main objects were accomplished for which I went to South America. The rainy season, showed signs of immediately coming on, else I should have visited other points of the range and perhaps crossed some of its passes, but it is unlikely that any substantial discoveries would have been made. Enough had been done to ascertain that this great ridge is not of volcanic formation in any part of its length, but, like the Alps and the Himalayas, has been heaved aloft by a series of earth movements, probably of very ancient date. It is in the coast range, or outer Cordillera, that volcanic energies have been and still are spending themselves. The recently extinct volcano Misti, seen by us at Arequipa on our upward way, was a type of the mountains we were now to visit on our way down to the Pacific at Antofagasta.

From several high points we had also beheld, far away across the high Bolivian desert, the snow-crowned cone of Sajama, perhaps the highest of the series of great volcanoes. To climb it was part of my plan, but difficulties about mules, and the limited time at my disposal, made the realization of this project impossible. Rumbles of the approaching revolution were already heard, and though I was overwhelmed with kindness alike on the part of members of the government and of the opposition, since successful, the times were not propitious for exploration. Accordingly, with my two Alpine guides, Antoine Maquignaz and Louis Pellissier, I quitted La Paz on the 13th of November, and drove in three days along the highroad of the Bolivian plateau to the mining centre and railway terminus at Oruro. The snowy range became a smaller vision in the increasing distance, and was often hidden from view by un-

dulations in the ground, yet even from a low eminence near Oruro, Illimani still remained in sight on the far horizon.

The Puna, between Lake Titicaca and La Paz, is densely populated by Indians. From La Paz southward the population is sparse, and for miles and miles no human being is encountered. Our vehicle was a crazy kind of American buggy. We shared it with a polite Colombian from Bogotá. The driver was a wild and casual whip, who would gallop his sorry team of horses or mules for a mile or two over a road that made the ramshackle thing bounce like a ball, and would then let them drag it along at a snail's pace, while he dropped off to sleep. In his active moments he would stamp his feet, shout, whistle, jab the wheelers in the rear with a chunk of wood, while he chucked at the leaders with unerring aim stones carried *ad hoc* under his seat. The mornings of each day were cool, even cold; but as the blazing sun rose aloft the desert was inundated with heat, and the glare became intolerable to the naked eye. There came a fiery brilliancy into the blueness of the sky, whilst the desert boiled with trembling air currents, or vanished beneath mirage. Here and there wild and graceful *vicuñas* were seen, sometimes even on the road itself, and once a condor actually rose for a stupendous flight from the track not fifty yards in front of our vehicle. The mail-cart was encountered coming from Oruro. Both drivers pulled up and gazed at each other for a long time in silence. Then, "What news?" said our man. "Nothing," replied the other. "What did he say?" asked our man, continuing some discussion interrupted perhaps a month before. "Nothing," was the reply. "Good," responded our man, and drove on.

We halted at Ayo-ayo for the night, just as rain began to fall. The sun set grandly beyond a leaden earth and beneath a leaden sky supported on pillars of thunder-storm, between which, as it were a wide window opened to the glow-

ing west, framed and barred with gold, the rich, low light came flooding over the mud village and made it appear for a moment like the new Jerusalem built all of precious stones. Long stretches of the road, next day and the day after, were marked every two hundred paces or so by mud-built towers about twenty feet high, remains of the days of Spanish rule. A line of such pilasters, stretching for miles over the plain, is by no means unimpressive, though nowadays they are allowed to fall to ruin as they please. Time and again we passed ancient and long-abandoned habitations of the native population, some still retaining their mud roofs. Most of them were recently excavated by the Bandeliers, who came to meet us at a place festively called Patac-amaya (hundred corpses). While we were talking to them the summit of Illimani was still in sight in one direction, and that of Sajama in another. We halted for breakfast at Sicasica, a place that ought to be a rich mining centre, for the hills around are full of silver, copper, and tin. The silver was worked by the Spaniards, and I was told (though I did not verify the statement) that the neighboring chapel is roofed with sheets of it. Sicasica was an ill-omened place for us, for in its vicinity our baggage-wagon broke down, the wheel smashing utterly beyond repair. There was no other wagon nearer than La Paz, so a telegram was sent to fetch one. It came in two days, and bore the baggage perhaps forty miles farther before it in turn smashed up. Then another wagon was fetched from Oruro, which ultimately conveyed our goods to the railway four days late.

While waiting for the baggage at Oruro I visited the great silver-mines of San José. The delay caused the loss of a train, rather a serious matter when there are only three a week. At last, however, we were able to start. The cars were crowded, and the tame *vicuña* of the town came down to see us off, as is his invariable habit. The line ran on through a desert like that over which we had driven. This desert, I may observe, continues unbroken to the sea. The people in the train, like all the inhabitants of Oruro, talked of nothing but minerals, and kept pointing out the situation of mineral deposits, all fabled to be of incredible richness—here a mine of silver, there rich deposits of copper, tin,

and so on. The mineral wealth may be exaggerated, but it certainly exists. We passed near and even along the margin of Lake Poopo, a sheet of water communicating with Titicaca by the river called Desaguadero; but I never knew when the lake came, for it was impossible to distinguish the mirages from water or the water from mirage. Once I was sure it was water, with islands, boats, and sailing-vessels; but the islands proved to be hills rising out of the plain, the boats were mounds, and the sails mere tussocks of grass. The bright sand of the desert, the purple-pink hills, the clear sky, and the great sense of space made every outlook glorious in the overwhelming sunshine. The hills flocked in upon our passage, and as we swung round a corner, behold! a snow-white dry salt river-bed cutting across steep-tilted volcanic strata of all colors, green, blue, red, purple, with blue hills far away. What a flashing glory of color it was! The sun lowered, the plain widened, smoking with blown dust in the far distance, from which, as from a cloud, low blue hills rose against a lemon sky, beyond the widest and flattest desert imaginable, bending only with the curvature of the world.

The train stopped a day at Uyuni, and I had hoped to spend the time in the Pucacayo mine; but the managers wanted no "chiel among them takin' notes" just then, for report said there had been a further great inrush of water, and they were in danger of being utterly flooded out. On we sped again next day through the wilderness—not a man, not a house, not even a *vicuña*, seldom a track, the only change a change of surface texture and colors—white, gray, rough, smooth, bare, or tussocky. But at mid-day came a more exciting region, and we were amongst smoking volcanoes with flat white deposits interspersed, like lakes frozen and snowed over. One of the white dry lakes had a coal-black shore of volcanic ash. The smoking, or rather steaming, volcano had sulphur-yellow and rose-red patches and streaks. No colors seemed impossible in this strange landscape, except those of living things. Nowhere was visible a sign of life. Another smoking volcano, S. Pedro, came by just as we were crossing the frontier between Bolivia and Chile. At its foot was a small cone with a stream of lava two or three miles long, stretching away over the plain as though newly

erupted. It looked just like a moraine-covered glacier, with its dark tumbled surface and rugged sides and snout. The railway goes right through it in the most remarkable cutting I ever saw. With this stream of lava for foreground, the big smoking volcano and its attendant small craters just behind, and all manner of volcanic hills and mountains in every direction, with a cinder-strewn desert about them and the fiery sky above, the view was as weird and unusual to an earth-dweller as a landscape of the moon. Over against S. Pedro is the Cerro Colorado, consisting, they said, of magnetic iron. Its sand leaps into the air when there is a suitable thunder-storm, and flies about in sheets and masses, to the horror of local Indians. Earthquakes continually shake the neighborhood, and floods scour it in the rains, yet people live here and dig out nitrates! We spent a night at Calama (at the Grand Central Hotel, if you please!), a place that looks like Port Said with the top stories taken off. Then on through more deserts and nitrate-fields, along by extinct volcanoes innumerable, and so down and down till we rattled round a corner, and there was the Pacific Ocean glittering in the perfect evening sunshine. Next morning I sailed from Antofagasta, and landed at Valparaiso a few days later.

I received more kindness in half a day at Valparaiso than I could return thanks for in a column, for I arrived there without introductions, but desirous of ascending Aconcagua. The road was at once made easy for me, the right people were telegraphed to make preparations and engage men and mules, so that in two or three days I was able to start. It was no question of making the first ascent of that fine mountain, which, as everybody knows, was ascended by Mr. Vines and my old Himalayan guide Zurbriggen, members of Mr. E. A. FitzGerald's expedition, at the beginning of 1897. Mr. FitzGerald is an old friend of mine. He had been my companion in a novel summer's journey, recorded in my book *The Alps from End to End*. I had followed his proceedings with the deepest interest, read all that he had written on the subject, and conversed with him about the mountain before leaving home. He had urged me to make the ascent, and had given me all information possible to facilitate it. My ascent of Aconcagua was not a scientific, but a merely sporting expedition. The

mountain had been measured by FitzGerald with greater accuracy and care than any other high mountain in the world has ever been measured. He had also fixed its position astronomically with great exactitude, and had mapped the peak and its neighborhood most beautifully. When his book comes out the public will learn, as at this time of writing it does not know, how excellent was the work done by the FitzGerald party. I write thus because when I returned from a successful ascent after ten days' absence from Valparaiso the opinion of uninformed persons was that I had in some fashion surpassed the exploits of my predecessors, who spent seven months or more on or about the mountain. To begin with, had they not preceded me I should probably have had to expend the best part of a month in searching for the way, which is by no means obvious. Again, the time actually spent by them on the ascent was but little longer than that taken by me. Each of their camps was practically a well-fitted observatory; at each they made a long series of observations. The mere determination of the position of the Inca Hotel, from which they started, as I did, took them a month or more. They made a complete examination of the geology and natural history of the neighborhood. It is obvious that my climb cannot be compared with their expedition in any way, and I am the last to desire any comparison between the two to be made. If hereafter the summit of Sorata is attained by some more lucky climber than I was, he will owe to me the same recognition that I hereby gladly render to FitzGerald.

Aconcagua (pronounced Aconcawa) is not situated in Chile any more than Mont Blanc is in Switzerland. The boundary between Chile and the Argentine is the water-shed ridge of the Andes. Aconcagua stands on a secondary ridge, a few miles east of the water-shed, and is wholly Argentine. The main pass over the water-shed is the Uspallata Cumbre, which is approached by railways from both sides, and forms the main line of land communication between Valparaiso and Buenos Ayres. Some day a tunnel will join the two railways, and the route will be kept open all the year round. At present it is closed to ordinary traffic in the winter months. Aconcagua lies on the north side of this main road, and is best approached by the tributary Hor-

cones Valley, which debouches on the road at the Baths of Inca, where there is a hotel. This hotel is the natural starting-point for the ascent, and to it, accordingly, we had to make our way.

It was the 30th of November when we left Valparaiso by train—a date corresponding to the 30th of May in Northern latitudes. For the ascent of high mountains this would be early in the season anyhow; but in 1898 it was exceptionally early, for the winter had been unusually long and very snowy. At Inca they told me that snow was still lying in places from which it had melted away two months earlier in 1897. When the train arrived near the Aconcagua River, which the line follows for many miles, the raging flood that was coming down proved the rapidity with which snow was melting higher up. In fact, thus far the conditions seemed as bad as possible for a high ascent. Every one prophesied, and I quite expected that we should have to wait at Inca for a month. The only incident of the railroad journey worth record was that my baggage (though in charge of a company called Transportes Unidos, who guaranteed to take care of it or pay damages) was broken into by thieves, who abstracted from it a number of useful articles, including my revolver. I never received any compensation.

I quitted the train at the terminus, Salto del Soldado, and, in company with the rest of the transandean passengers, rode away on mules provided for us. In fact, we were a common personally conducted party all the way to Inca, and travelled like so many Cook's tourists. It was a novel experience, and less detestable than I should have expected. The way led up a fine valley, with plenty of waterfalls about, snow avalanches at intervals fallen across the road, and numbers of rocks fallen upon it. About sunset we reached a rough-and-tumble inn, named Juncal, situated just where the valley forks, one branch going up the Cumbre, the other to the big mountain Tupungato, which was climbed by members of the FitzGerald party.

We were ferreted out of the inn next morning at 3.30, in the sheer midnight darkness, and the ascent immediately began. The weather was magnificent, and so remained all day. In less than an hour the edge of the winter snow was reached and progress became interesting.

It was, in fact, the opening day of the season. The company undertook to get travellers across within a stated time; before this day they had had to cross at their own risk. The snow was hard-frozen and the track well trodden, so that we made good progress. Some of the slopes were remarkably steep for mules, but the brave beasts did not falter. A couple of hours' steep ascent ended on a plateau where two valleys join and the Portillo Inn is built. But for the closed inn we might have thought ourselves in the region of eternal snow, so deep and white was the covering. A bleak hollow here holds a lake, that was still frozen and snowed over. Another steep ascent, and we entered a flatter valley completely buried in snow, over which our heterogeneous caravan laboriously struggled. Many of its members were far from being expert riders, so that falls from the plunging mules were not infrequent. One man, who had fallen on his head and cut his face open against the highroad below, was here a particularly active performer; but the snow was by this time soft, so no bones were broken.

The final ascent to the Cumbre led up a fairly steep slope, where the snow was deep and now melting in the hot sun. Being far ahead of the caravan, I arrived on the summit at 8 A.M., but in the hour or two that followed the snow became very soft, and the floundering of the mules was terrible to see; they were, however, accustomed to the work, and generally extricated themselves, though several had to be unloaded first, and most of them shot their living loads when in a difficulty. Neither in front nor behind is the view extensive from the Cumbre: big mountains shut it in. Even Aconcagua is hidden by the broad and splendid Torlosa peak. The striking fact, to my eyes, was the quantity of winter snow remaining, and the low level at which it lay. From the pass I descended a long slope covered with loose débris, and so gained the posada of Las Cuevas, down on the floor of the main valley, near the mouth of the future tunnel. Buggies were awaiting us, each drawn by four horses harnessed side by side, like a *quadriga*. After glancing up the Cuevas Valley, which was filled with snow to the very edge of its stream, we drove away, and arrived at the Baths of Inca in an hour. A short distance before reaching the hotel,



THE LOWER PEAKS OF THE ACONCAGUA GROUP, FROM THE CUMBRE.

Aconcagua appeared in great splendor at the head of the Horcones Valley.

The position of the establishment is determined by some remarkable hot springs, strongly charged with various mineral ingredients. They ooze up at many points from the ground and form highly colored deposits wherever they trickle. A natural bridge of conglomerate that arches over the torrent is likewise due to infiltration from them. It is one of the largest natural bridges in the world, and the road to the hotel goes over it. Dr. Cotton, the proprietor of the establishment, greeted me with the welcome news that he had engaged porters and mules for me, and that a man, sent by him up the Horcones Valley to inspect, reported that it was clear of snow as far as he had gone or could see. Dr. Cotton said that so far from there being a difficulty in enlisting porters, every adventurous individual was eager to come with us, such was the interest which FitzGer-

ald's expedition had excited in the neighborhood. This was another instance of how I was helped by coming after Fitz-Gerald. The natural unwillingness of the natives to venture into the upper regions had been broken down by him, and a great eagerness to go had taken its place.

Thus at six o'clock in the morning of the very next day (December 3) I was able to quit once more the haunts of men and strive for the high abodes of the mountain gods. We were a party of six men and ten mules. There were my two Alpine guides, Maquignaz and Pellissier, and there were three strong local men, Anacleto Olavarria and two others. Dr. Cotton started with us, and we rode gayly away up the right bank of the Horcones Valley in as perfect weather as the heart of man could desire. Aconcagua was visible ahead. Fine mountains of lower elevation, built out of many-colored volcanic rocks, were on our right hand. One of them, named Almacenes (stores), is



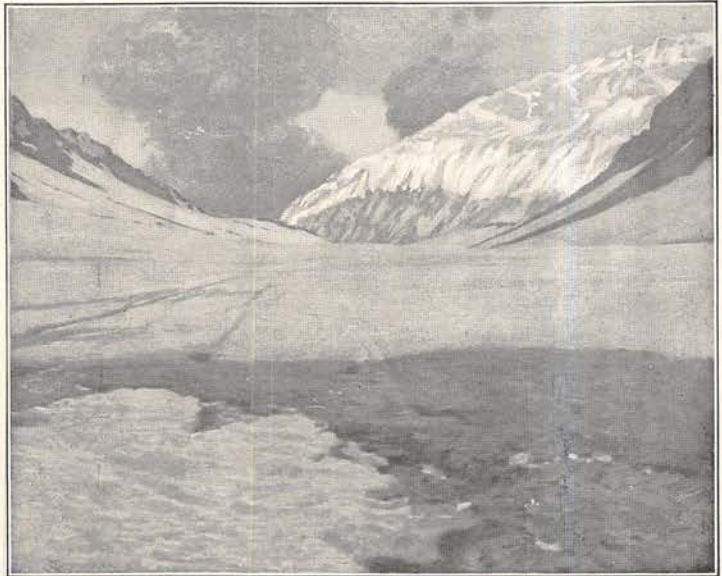
INCA LAKE.

evidently so called from its vertical summit cliff, lined in the most curious manner by the edges of countless volcanic strata, all of different bright colors, like a pile of pieces of cotton goods in a draper's shop. Proceeding merrily for an hour and a half, we came to a point where the configuration of the ground forced us to cross to the other bank. Though so early in the day, the river was already in flood, and to ford it was not easy; but all crossed safely, though wet to the waist. A short way farther on we came to a steep slope of hard avalanche snow extending right across the route. It could not be turned, for it ended in the torrent below and reached to a cliff far above. Such a slope if encountered on a mountain would involve careful step-cutting, for it was steeper than the slope at the top of the Zermatt Breithorn, and it was too hard to tread

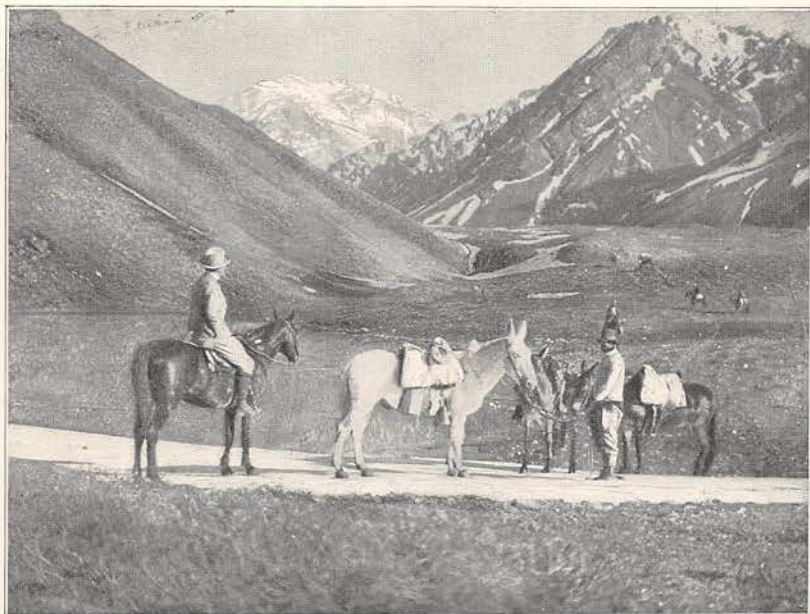
steps in. To my astonishment, and the loudly expressed wonder of the guides, the baggage-mules walked straight over before I had time to take out the camera, to my enduring regret. I watched them in dismay, not dreaming that they could possibly cross in safety, and fearing that all my baggage would go slithering down with them into the raging torrent below. But nothing went wrong, so I followed, and had fortunately passed the steepest bit before my mule actually did begin to slide

down. I clapped spurs into her, and she gave a mighty wriggle and jump, which just brought her fore feet on to rocks. The guides thereupon followed on foot.

Farther on, and at infrequent intervals thenceforward, came sheets of what are called *nieves penitentes*—that is to say, areas covered with spires of snow, from one to five feet in height, with their bases in contact with one another. It has been believed that eddying and violent winds



ON THE TRANSANDEAN ROUTE.



THE MOUTH OF THE HORCONES VALLEY, ACONCAGUA IN THE DISTANCE.

are the cause of this strange phenomenon, but such is not the case. They are produced by the melting of a thick bed of snow under the hot and almost vertical sun. You never find them formed of fresh snow, but always out of an old snow bed. As the summer advances they grow larger by the melting of the hollows between them. They are cones not of circular but elliptic section, the major axis of the ellipse lying invariably east and west, with a twist to north or south according as their situation is more or less shaded from the morning or evening sun by neighboring hills. I observed examples of them in all stages of development. First, a dimpled snow surface; then a surface slightly mounded with oval hollows between the little mounds; then with the hollows deeper and running into one another, forming short spires by the junction of four hollows, and then with spires of larger and larger size. Where a snow bed was not too deep, the hollows would eventually penetrate to the surface of the ground below, and the spires would be left standing on it like so many chessmen. Riding through a field of these *penitentes* was often a difficult business.

The route became increasingly painful, and some very steep slopes of *débris* had

to be descended or traversed. I photographed the bell-pony, who leads the caravan, ascending one of these slopes on the return journey. Riding down the same slope, on our way up, was rather an exciting experience to novices. At the mouth of the Horcones Valley we had crossed an immense accumulation of ancient moraines, deposited there when Aconcagua's glaciers reached all the way to Inca. Now we came upon a second set of moraines, deposited at a later date by the south glacier, which has now retreated many miles away from them up its own valley. This is the glacier whose snows lie on the steep south face of Aconcagua, to which we shall have occasion to refer later on. Our ascent was to be made by the west face, to reach the foot of which we were obliged to continue up the main valley for several miles.

The river had to be forded again, and a steep track scrambled up. Three hours from Inca we at last came out beyond all the moraines and entered a broad, flat-bottomed desert valley, here leaving behind the relatively fertile area (compared with Bolivia) which we had thus far traversed. Later in the season, I am told, there is a good deal of vegetation even here. From this point to the foot of



IN THE HORCONES VALLEY—MEY AND ALMACENES.

Aconcagua the scenery is splendid, for there are the grand precipices and crags of Aconcagua on the one hand and a series of fine splintered peaks on the other. All the rocks are volcanic, and have the characteristic friability of volcanic rocks, yielding steep cliffs, sharp ridges, and splintered peaks, and pouring down vast piles of loose and small débris over their bases. The coloring of the strata was surprisingly varied and bright, so that the débris slopes, when fed by fragments from several kinds of rock, resembled the mixture of pure colors on a palette. The streams coming from the melting snows high aloft were often dyed with dust of the débris they flowed over or trickled through. Several were red or crimson, and brilliantly stained their beds and banks.

An hour or so of easy riding brought us to a point where the bottom of the valley narrowed again to a gorge, and we were forced to the steep and uneven slope on the east side. Where the ascent began was a big fallen rock, and under it the remains of a fire and some empty meat-tins—remnants of FitzGerald's expedition. We took the

hint, and halted for lunch. Henceforward the way was difficult, owing to the big débris fans, cut up by countless gullies, each troublesome enough to climb into and out of (but babies, in fact, compared with corresponding Himalayan or even Spitsbergen impediments), and to the large fields of *nieves penitentes*. But the end of the valley steadily approached. Riding some distance

ahead of the others, I saw a group of big fallen rocks with flat ground between and around them. There was a stream of fresh water near at hand. It seemed an ideal camping-place, and so my mule thought, for she made straight for it, turned in between two big rocks, as into a stable, and halted. I thought she might have been here before with FitzGerald, and that this was the site of his 14,000-foot camp. My suspicions were confirmed by finding some empty meat-tins and an old biscuit-box sunk into the ground and covered with pieces of a London newspaper containing accounts of the Jameson Raid inquiry. How far away,



FORDING THE HORCONES TORRENT.



dreamlike, and unimportant it seemed in the midst of such surroundings! The biscuit-tin was one of Philip Gosse's beetle-traps. As a matter of fact, FitzGerald had camped half a mile farther up, and we should have done well to follow his example; but knowing no better, we halted here, unloaded the baggage, and sent the mules away. An hour after they had gone, we found out our mistake.

Next day (December 4), the weather continuing magnificent, I sent off the two guides and two local porters, well laden, to find a camping-place at about 16,000 feet, leave the stuff there, and return. They performed the task creditably, finding the site of FitzGerald's middle encampment, and some of his tracks still remaining. Meanwhile I went alone up the side-valley opposite our tents, where frost had made, by help of a stream, a series of ice terraces of entrancing beauty, for each was fringed with icicles sparkling in the sunshine, and the whole was framed between rocks exquisitely colored. The rest of my time was

A CARAVAN IN THE HORCONES VALLEY.

devoted to examining and measuring *nieves penitentes* and regarding Aconcagua's grand expanse. The great western face rose above me in steps with vertical fronts, all delicately stratified in layers of many colors. The whole seemed a mere chaos of jutting buttresses with gullies between, and had anything but an easy appearance. There was little snow lying on this side of the mountain. As a matter of fact, the long débris slope by which one ascends was



HIGH UP ON ACONCAGUA. LOOKING WEST.



BASE CAMP.



THE UPPER LEVEL OF THE HORCONES VALLEY.

hidden round a corner. Its existence is not suspected till you are actually on the side of the peak. The guides returned in good spirits, and we went early to sleep.

We set forth on the 5th at 6.30 A.M., to establish ourselves at the higher camp. All were well laden and climbed slowly. The valley was followed as far as FitzGerald's base camp. Thence we mounted *débris* and followed the crest of the moraine of the glacier that fills the valley's head, until, in an hour, the foot of a long gully full of old avalanche snow was reached. The snow was good, and led straight and steeply in the direction in which we wanted to proceed. Sometimes on snow and sometimes on loose *débris* beside it we mounted, with many pauses to draw breath and admire the glorious views. At the top of the gully came one of the small rock shelves, with a short face of cliff below it, that occasionally crop out of the otherwise monotonous slope of loose

stones which reaches from the glacier below to the crags near Aconcagua's summit. Those crags themselves are nothing more than the highest and largest of these emergent cliffs. A few minutes above the first shelf came another, involving a pleasant rock-scramble, and it was above that that we pitched camp on a convenient level spot about eleven o'clock in the morning. We might have gone farther, but every one was tired, for load-bearing even at 16,000 feet is rapidly fatiguing. The remainder of the day was a long-drawn-out misery, owing to the rage of the scorching sun. Our heads ached and throbbed with pain. We were in a magnificent position, with views of

the greatest beauty and extent in all directions, but it was impossible to enjoy them. Clouds towered aloft in the afternoon everywhere, except between us and the sun; but when it came near setting they faded away, the heat diminished, our headaches vanished, and all became happy and hopeful once more. With darkness came frost. The night's minimum temperature was 10° Fahr.

Next morning (December 6) we started again at 6.30 to push on to a yet higher camping-place. One of our two porters was ill, and had to be left behind; so the little tents, sleeping-bags, and other necessaries were carried by the four of us. The morning was again fine, with cold gusts of wind. The ascent was dull and most fatiguing, over loose stones all the way. An hour took us to the next shelf; half an hour more to the foot of a red wall, which we ascended by a gully. Thence we floundered up some more loose stones to a little platform, which looked as though it might have been used for camping. An old duster was found here between some rocks, so we concluded that this was the site of FitzGerald's top camp, and accordingly pitched our tents

and settled down. Again, as a matter of fact, FitzGerald's top camp was not here at all.

As we stood looking upward, the remainder of the route to be followed was clearly visible. An uninterrupted slope of *débris* stretched from us to the highest crags of the mountain. This slope was



NIEVES PENITENTES.

bounded close on our right hand by a cliff that fell away into a gully. It was near the edge of this cliff that we camped. Half a mile or so away to the left the *débris* slope was bounded by the main northwestern ridge of Aconcagua. It was on that ridge that FitzGerald had camped, and his old duster must have been blown thence to where we found it. Had we camped where he did we might have followed the ridge and avoided some of the loose stones; as it was, our necessary way lay straight up them to the foot of one of the gullies in the final rock wall. The summit ridge of Aconcagua is about two miles long. The highest point, to our left, was not, I believe, in view, but the second peak was clearly visible to our right, and the gully close by us led towards it. I had half a mind to climb the gully to that peak, and I now wish we had done so. It would have been a more interesting climb. The heat this afternoon was not so unbearable as it had been the previous day, but it was bad enough. There is nothing so stifling as a tent with the sun shining on it, so I built up a thicker shelter for my head out of sleeping-bags supported on ice-axes. At



FROM THE SUMMIT RIDGE, LOOKING OUT OF THE GULLY.



FROM THE SUMMIT RIDGE, LOOKING EAST TO THE ARGENTINE PAMPA.



FROM THE SUMMIT RIDGE, LOOKING NORTH TO MOUNT MERCEDARIO.

19,000 feet comfort is unattainable. Everything is exaggerated. If the sun shines, it scorches; if it goes behind a cloud, you freeze. If there is a wind, it blows your head off. In the early afternoon the sky blackened over and we shivered. At three o'clock there was thunder. At five the sky was clear again, and the sun set in great glory, foundering into the leaden expanse of the Pacific. The view, of course, was splendid, but I was never in the mood to enjoy it. The one solid satisfaction we had was in seeing the weather again set fine.

Maquignaz, full of his old Alpine traditions, which are often out of place on higher mountains, roused us all in the middle of the night, when the thermometer was down at 5° Fahr., and the blackness of darkness reigned. There was little or no wind. At 3.30 we started up the loose stones, following Maquignaz, who led the way with a lantern. As far as climbing went, there is nothing to record for our next six

hours, except that we pressed on slowly up the quite monotonous slope of loose stones. It is easy to write. It was horrible in every moment of the performance. The higher we rose the lower was the temperature and the looser were the stones. Every one knows how loose stones fatigue even at low levels. At 20,000 feet they break a man's heart. There was no occasion to put on the rope; we walked separately and floundered about, each nourishing his own distress, not always in silence.

As we pounded our melancholy way upward the gray dawn crept over the hills, and the white world became visible far away—a land of death and silence. What happened in the east we could not see, but in due season the western sky faintly flushed, then burned red along the rim of the ocean. When the sun actually rose we knew it by the sudden appearance of Aconcagua's monstrous shadow, a purple cone with its point on the horizon. There is nothing more impressive than these cones of mountain shadow, but to see one you must be high up within it, and a far horizon must be in sight to the west. You must, in fact, be on the shadowed side and near the summit of a peak that stands out above all its neighbors and is near a low-lying country or the sea. Only twice can I remember to have seen in perfection such a sight—on Mount Hedgehog in Spitsbergen and on Aconcagua. As the sun rises higher the distant point of the cone slowly drops down to the earth and gradually approaches. You can watch its solemn and stately motion. But it is the effect of color that is most marvellous. For the shadow has a semi-solid look; it does not merely seem to lie upon the earth; it fills the air with a rich transparent purple tone. Outside it, flames the red or runs the gold of the direct sunshine, likewise filling the air as it were with fire, as well as covering the earth. Time and again I halted to watch the wonder of this gorgeous dawn, but always the cold drove me to action all too soon.

The light load, which was all we attempted to carry to the top, was upon the back of Pellissier. It gradually became obvious that it was more than he could bear. He had been unwell already on the previous day, and the diminished atmospheric pressure continued to derange his functions. Till the sunlight reached

us the cold was far too intense to permit us to halt for him. What the actual temperature may have been I can only guess; doubtless it was many degrees below zero. At camp it was 5° Fahr., and felt comparatively warm; at 21,000 feet (before the sun caught us) the cold was like a piercing sword. The diminished atmospheric pressure and consequently reduced supply of oxygen doubtless makes the body more sensitive to cold, but the extra 2000 feet of height alone suffices to reduce the temperature by many degrees. Once in the sunshine, we could halt for Pellissier to come up. He then said he could go no farther, so Maquignaz took the load, and Pellissier turned back. He had no suspicion that he was frost-bitten, but on arrival at camp he felt something wrong with one foot, took off his boot, and found the whole front half of the foot black as far as the instep. He took off the other boot, and found that foot in the same condition. He spent the next five hours diligently rubbing them with snow, thereby just saving them from utter destruction. That a hardy man like Pellissier, used from his infancy to the cold of Alpine winters, was thus seriously frost-bitten in four hours, while taking violent exercise, and through two very thick pairs of woolen stockings, proves the severity of the cold. My own feet, in the foot-gear I have described, were never even chilly.

Meanwhile Maquignaz and I were working upward at a continually decreasing pace. Once or twice he turned round to me and said, "We shall never get up to the top." I replied, "We shall, even if we have to live here." Arguments are brief between two men gasping for breath like fishes out of water. The clearness of the air and the featurelessness of the long *débris* slope had made the upper rocks seem deceptively near when looked at from camp. We reckoned three hours for the ascent of the *débris*, but privately I thought, and doubtless so did Maquignaz, that three hours was an outside allowance. If we had reached the rocks in one hour, I should not have been surprised. But six hours passed, and still we had not touched them. It was not that we often halted. The air was still too cold for halting to be pleasant; one had to keep in motion, but we went slower and slower. Hope and expectation vanished in a mere dogged determination to take one more step, and then

another. Every step was a compromise between an advance and a back-sliding, for all the stones under our feet were small and loose. Sometimes they were smaller and looser than at other times, but I don't suppose there was a step taken on this face that did not give way somewhat when the weight of the body was thrown forward upon the foot. Often it gave way altogether, so that after all the struggle of an upward step, the level of the body was not raised. The final snow slope of Sorata was worse than this, but it was nothing like so long.

I have more than once referred to the upper crags or cliff of the mountain, the foot of which we were now on the point of attaining. The top ridge of Aconcagua was once an almost flat or gently sloping strip of high land terminated on both sides by a cliff. On the east this cliff remains. On the west it has been eroded into a number of funnel-shaped gullies, narrow below and broad above, where they almost or quite join one another, leaving a number of cliff-ended buttresses sticking out from what is now a very narrow summit arête. The ascent to that arête has to be made up one of these gullies. The FitzGerald parties chose the gully most to the left, which is the natural line of ascent towards the highest peak. We were circling round under the foot of the cliff, which comes down much deeper on the right than it does on the left, and it was our intention to strike up FitzGerald's gully. Unfortunately the stones became looser and looser, till progress upward was nearly impossible. When, then, at last we found ourselves at the foot of a gully that led straight up to the summit ridge, and was clogged with large stones firmly wedged together, we decided to go up it instead of circling on round the loose débris. I think this gully was the third from the left. It is easily recognized by a remarkably sharp pillar, or finger, of rock that arises near its mouth.

Even at our camp below, the view had been one of astonishing grandeur and extent. As we climbed, it developed. Under ordinary circumstances I should have made notes of it on the spot, but the cold was far too intense to permit the holding of a pencil in a naked hand. For the same reason I was not able to take photographs. What remains of this noble prospect in my memory is the vast ex-

pense of white mountains that were visible, stretching away in rows to north and south, and gradually diminishing in size and whiteness to the west, till there came the green hills and lowlands of Chile, and finally the leaden Pacific Ocean. I never saw a spark of sunshine reflected from the surface of the ocean, or any glimmering of light upon it, during the three days it was in our view; it always bore the semblance of a plain of lead, flat and solid as a desert. Sometimes it faded away into the sky without any line of division; at other times, and generally, the horizon-line was clear and sharply defined.

The prominent fact about the mountains, a fact that became more emphatically obvious when we stood on the summit ridge, was that they were a connected group of ranges, not a mountain area of tangled form like the Alps, but a backbone, a long narrow mass dividing two lowlands. You looked along them to north and south, and saw them stretching away and yet away in their whiteness, till the world bent them out of sight. Toward the east or the west you looked across them, and soon came to the green lowlands. The foreground peaks were finely jagged; but to north and south summits and crests so thronged upon one another that it was impossible to disentangle their intricacy or isolate them as individuals, except in the case of two great mountains which far surpassed their neighbors—Tupungato in the south and Mercedario in the north. The latter mountain particularly engaged my attention, for it had the appearance of being almost if not quite as high as Aconcagua. Had I known of its existence before, I should have attempted to climb it rather than Aconcagua. It is a mountain well worth the attention of climbers, and, being enveloped in glaciers divided by rocky crests, would afford a more enjoyable scramble than the peak we were stumbling up. There is certainly a practicable route from the south, and perhaps also from other sides.

Maquignaz and I now turned up the gully, and climbed it with our right hands on the solid rock. There were a few beds of hard snow, pleasant to tread on after the loose stones, and there were also firmly wedged rocks which did not give under the foot. It was a long gully, and of course we climbed but slowly.

The higher we climbed the steeper it was; but the fine crest of snow at the top was steadily approached, and at last we stood upon it—the summit ridge of Aconcagua was won. No more sudden change of scene than that last step produced can well be imagined. Instead of a slope of rocks before our faces and a wall on either hand, we stood upon a knife-edge of snow, with Aconcagua's wonderful east cliff falling straight down some ten thousand feet, apparently sheer to the gray glacier below. At the same instant the whole eastward view was suddenly revealed, quite free from clouds. It resembled the view on the other side, except that a great stretch of pampa was visible to the northeast, flat like the western ocean, and only differing from it in color. Now it was that the backbone aspect of the mountain range became so evident, as we saw the continent sloping away to right and left, and the ridge continuing ahead and behind.

The snow crest on which we were standing led in both directions to higher points. North was Vines's summit, south the fine snow pyramid that looks towards Inca. I yearned to scramble along to the latter point, so fascinating was its white beauty; but the distance was great, and would have involved step-cutting all the way, whilst if a wind had sprung up, we should have been blown away without possibility of salvation. Accordingly we turned north, and cut steps along the crest, mounting over various undulations of the crest, till we had arrived upon a summit which commanded the whole panorama. It was doubtless a few feet lower than the very highest point a short way farther along. The simple fact is that we had overcome all the difficulties of the mountain, and, except from a pedantic point of view, were on the top. If it had been a first ascent, I should have taken the trouble to go to the neighboring point; but I did not, and for two good reasons: first, because of Pellissier's illness; secondly, because Zurbriggen, when he first ascended Aconcagua, made a record for altitude; I thought it likely that if I pushed on to his peak, I should be accused of mere jealousy, whereas if, after overcoming all the difficulties of the mountain and being within ten minutes of, and at the outside fifty feet below, the highest point, I turned back, I could not be so accused. When, therefore, Mr. Fitz-

Gerald claims, as he now does, that the ascents of the mountain made by members of his party were the only "complete" ascents, he is technically correct; but if I had imagined that my ascent would be called "an attempt," or "incomplete," I might perhaps have been tempted to act otherwise. All the day was before us. There was no difficulty, and we were not over-tired. Before turning down I nearly froze my fingers and lost all sensation in and power over them attempting to take some photographs. My camera had a somewhat complicated changing-box, easily enough worked at low levels, but not constructed for these difficult conditions. The result was that out of six films which I endeavored to expose, three were exposed twice over, and three not at all. The only photographs I brought down from the summit ridge of Aconcagua were those taken from the point where we first emerged upon it.

At noon we started to descend. Once out of the gully we took widely different routes, for the loose stones slipped down with us in such masses that we feared they might give rise to a kind of avalanche if we remained and were borne off together. Once I was fortunate enough to start such a mass of the stones that they peeled off and left the subjacent rock exposed for a moment—long enough to enable me to observe how it had been scraped and rubbed into a slope so smooth that it is no wonder the débris upon it are loose; the wonder is that they remain upon it at all. If the view that was behind us in our ascent had been before us in the descent, it would have been delightful, for now the cold was less, the labor was comparatively trifling, and the mind was in a condition to receive impressions. Unfortunately clouds had gathered so thickly on all the hills that there was no longer anything but clouds to be seen.

We reached camp about two hours after leaving the top. Pellissier, most unselfish of men, when he saw us approaching, left off rubbing his poor feet, and cooked soup, so that a most welcome bowl of it was ready for each of us on arrival. While I was drinking this he revealed to me the full measure of his misfortune, and I at once saw that immediate action was needful. At present he could wear boots; next day that would be impossible, so down we must go. Our sound porter had fortunately come up.

The things were quickly packed and divided, and the descent continued to the middle camp. The sick man who had rested there was roused up (funk was the worst part of *his* disease), the remaining stuff was packed, and we were off once more. Coming soon to the top of the snow, we rolled down the bundles of sleeping-bags and such property as would not break, and ourselves slid, rolled, and ran to the bottom. Anacleto, in high glee, insisted on my sitting upon a bundle which he dragged at the tail of his waistband. Holding on to this strange carriage was as fatiguing as climbing the peak, but for Anacleto's complete satisfaction it was necessary that I should do so. Finally, at six o'clock in the evening we arrived, with all our luggage, at the base camp, and Pellissier's retreat was secured. During the night great blisters came up all over the frost-bitten parts, and next day they were a sight to see; but he suffered little pain.

The morning was bright and sunshiny enough at our base camp, but revealed a very different state of things on Aconcagua. There a violent gale was raging, and the wind was tearing the clouds through the jagged crags like fleeces through a comb. Above 19,000 feet I do not think we could have lived this day. Nor did fine weather again return before I left the country. The clouds slowly settled down, lower each day. Two hours after we had crossed the Cordillera on our return the storm broke. Snow fell lower and lower. A week later I saw the Andes, from Santiago, white down to the orchard-level, whilst deluges of rain pursued me to Concepcion, and only ceased when I went on board the steamer at Lota *en route* for Tierra del Fuego.

On reaching our base camp in the evening of the descent we found a man awaiting me with a letter from Dr. Cotton and a bottle of something very strong

and pleasant to drink. He advised half a wine-glass of it now and again as a comforter. We divided the bottle into three equal parts, and finished the whole there and then. Nothing was ever more opportune. The man was sent off at once to summon the mules from the pasture to which I had sent them down. By noon next day the mules arrived, and we started down. It was late in the afternoon before we reached the upper ford, and the stream was in flood. The arriero suggested camping for the night, but I urged him to make an effort to cross. We lassoed each mule by the head, and some one on the bank held the lasso. Thus Anacleto and I got over, and then we drew the others across one by one. The ford was above a violent rapid. Several of the mules lost their footing and disappeared right under the water, as did the rider also in one case; but ultimately all were safely landed. The second ford gave less trouble, and then—spurs and a gallop to Inca, where we surprised the hotel by our unexpected return just as the twilight was fading away. Next day the baggage was sent off; the day after we followed, with Anacleto to show us how the Cumbre really should be crossed. The receipt is to quit the path and ride straight down hill, regardless of steepness or of the nature of the ground. Such riding as Anacleto displayed in his glory that day surpasses my powers of description. He left us at the railway terminus. We parted from him with regret. I gave him an ice-axe, tent, etc., and told him to set up as guide for Aconcagua. He is now the only native who knows the way, and he is perfectly capable of leading any traveller to the top, though he did not actually come with us much above the top camp. As the train started he waved a farewell. The same evening we reached Valparaiso, and our Aconcagua expedition ended where it began.

A CORRECTION.—On page 670 of our October number it was stated that Mr. Bandelier, "the Flinders Petrie of prehistoric Peru," was excavating for the National Museum at Washington. We are now informed that Mr. Bandelier was sent out by a generous citizen of New York, Mr. Henry Villard, in 1892, and since 1894 has been constantly employed by the trustees of the American Museum of Natural History, of New York. A great work on the people and the antiquities of the Highlands of Bolivia is in process of publication by the museum.—EDITOR.