ARGENTINE PLAINS AND ANDINE GLACIERS

WALTER LARDEN

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LAZO-ING CALVES IN ARGENTINA.

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LIFE ON AN ESTANCIA, AND AN EXPEDITION INTO THE ANDES

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WITH A MAP AND NINETY-ONE ILLUSTRATIONS

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PREFACE

For a book, written for an English public about a foreign country or colony, to be satisfactory, it must, I think, have one of three different origins.

The author may have spent his life, or a great part of it, in the country of which he is writing, and at the same time have kept in touch with England and English life; this last condition being essential if he is to make his description vivid, or even intelligible, to his English readers. I should say that we have in our literature such pictures of, *e.g.*, Australian life. But the case of a foreign country is different; and, in the case of Argentina in particular, this first sort of book may never be written. For it seems to me that the Pampas absorb men; old Anglo-Argentines lose touch with England, and feel no call to become interpreters. When in England they feel cramped, and only long to be back again in the free life of the "camp" [1]; writing has no attractions for them.

Again, a very able and observant man *might* conceivably make a raid into the country in question, stay here and there for a week or so, converse with old settlers of varied experience, and then make a good

[1] The plains. See p. 309.

book out of his own observations, supplemented largely by information drawn from standard works of reference. Such books, written by travellers, are, however, liable to be very superficial and full of errors; most, I should say, are criticised unfavourably by those who know the country well.

The third kind of book is that which describes faithfully what the writer observed during a prolonged stay in one district. Such a book may well fail to give a comprehensive view of the whole country; but it should at least be fairly free from erroneous statements, and should present with some vividness the life of the country as the writer saw it.

It is a book of this last kind that I have attempted to write, and my materials have been the following :—

It was as far back as 1868 that my brother went out to Argentina, and he is there still. The regular "letters home" told us of his experiences from the very beginning. We read, in the earlier years, of estancias built like forts, of unfenced cattle runs, of encounters with Indians, of hunting in the wilds. Then there came changes; the retreat of the Indians before advancing civilisation, the fencing in of runs, the importation of better stock. Of revolutions, too, we heard; and later, of the spread of the industrious Italian colonists, whose patient agricultural work has transformed, and is still transforming, the Pampas.

In 1888–9 I paid a visit of some six or seven months to the estancia where my brother still lives. I helped (in a very amateur way!) in the daily work,

and, by personal observation and talks with my brother, gained a very fair idea not only of the actual life on the estancia but also of much of the experiences of an English settler in earlier times and in other parts of this vast republic.

Twenty years later, in 1908–9, I paid a still longer visit of some eight or nine months to the same estancia, and therefore could observe the changes on this particular estate: the advance in prosperity, and the improvements in stock and in methods of work, as well as the enormous agricultural development due to the Italian colonists, to whom one-third of the estate was at the time let out. And, with the help of a good camera, I was able to carry back, in the form of some 800 negatives, a faithful record of the work of the estancia, of the history of one of the disastrous locust invasions, and of many other matters that came under my observation. [Alas! that my publishers can allow me but 91, out of all these, to be reproduced! What a vivid picture of things as they are out there could I not have given with (say) 200 full-plate illustrations!]

Finally my notes, which were in fact the MS. of this book in its rough form, were read carefully by two English estancieros of good experience, so that I may reasonably hope that no errors of importance will be found in the statements made.

Argentina is changing rapidly; but it may safely be asserted that the descriptions here given of life on an estancia and of the colonists' work will remain true for a very long time to come. Only, as the years

pass, the zone of the most rapid changes moves slowly outward; so that the picture here given of Santa Isabel as it was in 1908 may, in ten years' time, stand for a picture of some other estancia more remote from Buenos Aires.

Of my account of an expedition into the Andes, and of my visits to Valparaiso and Santiago, I need say nothing here; it is obviously the record of a passer-by, and, read as such, can hardly be misleading.

This book is essentially a personal narrative. But, for the benefit of those to whom Argentina is little but a name, I have given in an appendix some account of the history and geography of the Republic and some statistics indicating its present condition. This brief summary is necessarily faulty; and I recommend all who wish to know more about these matters to refer to other works, specially devoted to them, published by Mr. Fisher Unwin and others.

In conclusion I would say that, for all the opinions and views expressed in this book, and for any residual errors that may be found in it, I alone am responsible; and further, that if any note an absence of personal enthusiasm for Argentina on the writer's part, they will find the reason for this frankly acknowledged on p. 292 and elsewhere.

WALTER LARDEN.

OXFORD, *December*, 1910.

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[*** Two of the illustrations are reproductions of photos taken in 1869 by the writer's brother, and one is derived from a sketch made by the writer in 1889. The remaining eighty-eight are reproductions of photos taken by the writer in 1908–9.]

ARGENTINE PLAINS

CHAPTER I

THE VOYAGE OUT—BUENOS AIRES—LA PLATA

In the month of August, 1908, after an interval of twenty years to the very day, I set out for a second time for Buenos Aires; and again it was on a vessel belonging to one of the smaller lines—a vessel of some 6,400 tons, having a speed of about ten knots.

These smaller lines, in which the number of saloon passengers may be anything up to about twenty, offer some advantages. You are quiet, and you can wear flannels all day long; this last being no small gain in the tropics, where white shirts may become unstarched after half-an-hour's wear. If you have three congenial companions you can play games all day long, and you can with them visit the various ports touched at very comfortably. If you like fresh air, you will usually find the breezy smoking-room upon deck available for sleeping in.

But there are drawbacks!

On such a small ship one cannot break up into sets

in a natural way. One is brought into very close contact with all one's fellow passengers, some of whom may be quite uncongenial. Too often, intercourse with some of these leads to jars, while the holding aloof gives offence. The small ship-world is cut off from all larger outside interests, and mole-hills grow to mountains.

I myself suffered much from a fellow-passenger, quite excellent, I believe, as a judge of oxen, who "fancied himself" as an expert in science. I could not agree that Mars (which I *saw*) was invisible because it was "below the Northern hemisphere," nor that the mountains round Rio de Janeiro were "under the sea a thousand years ago"; nor did my scientific studies at Oxford enable me to endorse his views on the theory of binoculars, nor as regards the compass. And my disagreement seemed to arouse in him a singularly acute form of irritation.

However, in spite of some jarring, we all got on together fairly well until near the end of the voyage. Then there were earthquakes in evidence and eruptions imminent; but—we landed!

Our first halt was at Vigo, which we reached at 3 p.m. August 21st. I had been fortunate enough to find on board a Mr. and Mrs. —— who were known to me as having been neighbours of my brother in Argentina; and we had adopted a nice young Englishman as a fourth. It was a pleasant surprise to find at every port that the landing and return could be arranged for easily and reasonably; but I would

advise travellers to bargain for the *return* journey in a boat and to pay at the end.

Vigo appeared to me to be a town that had long been dead or sleeping, and was now waking to modern life. There was much of ruin and decay; but everywhere there was also building; and lines were being laid for the electric tram. Fancy there being a primitive ox-cart, whose wheels were very nearly solid discs of wood, and electric trams in the same street!

We had excellent coffee at an hotel, and then hired a two-horse carriage (at only three pesetas, or less than half-a-crown, an hour) and drove up to the fort so as to get a view.

The fort itself was a mere antiquated ruin of stone; one modern shell would have made the ruin complete. I tried my book-learned Spanish on an officer, asking him if I might photograph it. He told me that was "prohibido"; and I quite understood how ashamed any soldier must have felt of the picturesque but wholly inefficient old place.

I had been accustomed on the Continent (even in Switzerland) to a certain degree of dryness relatively to our own humid country, where every nook is filled with flowers, moss, or ferns. But, turning to the country here, the impression of aridity was almost startling, and weighed on me. Still the view was fine. Barren it was; but bold and free. The country is hilly and the whole effect picturesque; the fine masses of eucalyptus and pine-trees relieve the

desolation. One could become attached in a personal manner to such a land, as one—or at least I—could not to the monotonous green plains of alfalfa of modern Argentina.

On returning to the hotel we tried to pay our coachman with half-a-crown. He was very good-natured about the matter, but quite incredulous as to the value of the coin. When we changed it at the hotel for *more* than three pesetas he would not accept the odd bit, but told us with light-hearted cheerfulness to give it to a beggar. He was a capital sort of fellow.

Next day I managed to get on shore again and took photographs in the market. The illustration shows how the women carry the heavy baskets on their heads, using a pad. This method of carrying gives an erect and well-balanced gait.

At 11.45 a.m. August 22nd we started off again. Being at sea is—being at sea ; the scenery does not change, and nothing happens. Life seems to stop still and to contract until one reaches port again. We were roused into more active consciousness when on the evening of August 25th we found we were near Las Palmas. We had to cruise about, awaiting the day ; and we four only got some three hours on shore on August 26th. I visited the place again on my return, and will put together here what I noticed in the two visits.

Las Palmas is the chief town of the island called the " Gran Canaria," one of the Canary Islands. It is

VIGO. A SURVIVAL ; SEEN IN 1908.

VIGO. THE MARKET ON THE QUAY.

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mountainous, and appeared to me to be volcanic; the rock that I saw was, I should say, of the lava order and somewhat porous. The breakwater, which serves also as the quay, lies at some distance from Las Palmas itself; and, after landing, you drive along the coast to the town.

There is little beauty in this drive! We found it hot and dusty; straggling, ugly houses spoiled the road, while failing to convert it into a street. Everywhere was sand; sand on the road, sand heaped up in dunes, and sand collected about buildings and posts like the snow in Switzerland in winter. I noted at the time, "this sand seems out of keeping with the character of the island"; and on my return voyage I learned that it comes from Africa, blown over 130 miles of sea at least. More; the sand reaches Teneriffe, some 190 miles from the mainland whence it comes.

The impression that I received of the population was that they were a very mongrel lot, with much negro blood in them. But I must add that, on my return, after having got used to the Argentine population, in which there is much mixed blood in the lower strata, the Las Palmas folk impressed me less unfavourably than when I first saw them. When once we got to the town itself, the ugliness disappeared; the buildings were good, and the palm-trees and other tropical or sub-tropical trees and shrubs were picturesque and interesting to unaccustomed eyes.

We stopped to see the Cathedral. The interior

was at the time somewhat blocked and disfigured by a huge catafalque under which was to lie the body of a Bishop of Las Palmas who had died recently. But the whole effect was impressive; and I was much struck there, as I have been on the Continent, with the organisation of a Church that can plant such relatively magnificent buildings in such Heaven-forsaken, out-of-the-way places.

The wardrobe of vestments, displayed for us with much pride by a priest, did not impress me; but certainly it was a wonderful collection for a place like Las Palmas.

Next we got into our carriage again and drove uphill towards "Monte," a mountain resort (I was told) that limitations of time did not allow us to reach.

Though the hills were bare and arid and hot, we saw that bananas and other fruits grew luxuriantly in the hollows—perhaps under irrigation.

On our return to Las Palmas we went into the fruit market. A wonderful profusion of fruits! Bananas, figs, apples, pears, pumpkins, melons, grapes, plums, prickly pears, and passion-flower fruit. Certainly the soil must be productive.

That was all we had time to see; at 10 a.m. on August 26th we started once more, and this time for a really long spell—to Rio di Janeiro.

. . . . .

We saw whales blowing, threshers leaping (attacking the whales, I suppose), bonitos jumping, flying

A STREET IN LAS PALMAS.

BANANAS AND PALMS NEAR LAS PALMAS.

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fish; and once we crossed a tract of green water (instead of the usual blue). I imagine that this was a current of warm water in which organic life of some sort abounded; for green water implies a coarser-grained suspended matter.

Stars changed slowly; otherwise, and save for the increasing heat, one seemed to be the centre of a fixed and sharply-defined circle of ocean; we were "at sea," rather than sensibly travelling.

On September 2nd we expected soon to cross the line, so there were "Neptune" ceremonies. Judging by what I saw, this custom would be "more honoured in the breach than in the observance." The men—hardly any are true sailors in these boats—*began* with rum. The captain took care that first-class passengers were treated fairly gently. But the case of the steerage passengers was very different. These were emigrants, scantily provided with clothes, ignorant for the most part of English, and totally devoid of any power of seeing fun in the function ("and that was scarcely odd, because there" was not any there). These men should be protected against such brutal bullying. When one sees four or five well-fed and rum-excited men drenching and covering with a filthy mixture of soft-soap and tar a yelling and *biting* emigrant who has probably no change of clothes and no conveniences for cleaning and drying himself and his garments, it is sickening. The thing, as I saw it, should be stopped.

At 7 p.m. on September 9th we anchored inside

the islands Pay and Mai, near Rio, and next day had four hours on shore. But, alas for our anticipations! mist shrouded the hills; and a gray sky took all the brightness from what should be a most beautiful harbour.

Our short visit left me with regrets that we had not had fine weather, and twenty-four, or even forty-eight hours to spend on shore; for there are expeditions to be made.

The modern main street is the fine Avenida Central; in this the up-and-down traffics are each provided with a broad carriage-way; while down the centre, separating these, runs a line of great arc-light standards. Round these last there are not only refuges for foot-passengers, but even gay flower-beds. I was told that the Government got the land for this huge street very cheaply by rather sharp practice. The plan was kept secret; and the owners of the houses that would have to be demolished were asked for a return of the values of their properties. They, anticipating taxes, rated them very low, perhaps even at one-third their values; and then they were bought out at their own valuation.

The narrow old main street looks very unpretentious in comparison; but it is still a great place for shops, and *the* curio-shop is there. One could spend a fortune on the lovely feather-work, familiar to readers of Prescott, butterflies of enormous size and wonderful hues, jewelry, tropical beetles mounted in gold, and all sorts of things not to be found in London.

We took tram and made for the celebrated Botanical Gardens.

At Buenos Aires, Valparaiso, Santiago, and other sub-tropical places, the chief palms are those, of no great height, whose stems bristle all the way up with what appear to be the severed ribs of the huge fronds; and any clean-stemmed palms are stunted. But as one approaches tropical Rio one is aware of lofty trees whose bare trunks rise like columns of uniform thickness to an enormous height; the palm-trees of the tropical islands of which one has read when a boy. And in the Botanical Gardens there are magnificent avenues of these; some bearing coconuts, other without them, the female and male of the coco-palm respectively. But a drizzle much spoiled our visit there.

On the tram-ride we saw wonderful trees and plants in the gardens of the villas and houses standing by the road-side. One tree especially remains pictured in my memory. It had leaves of an intense and translucent crimson that resembled the petals of some magnificent flower; I was told that it was a Poinsettia.

We sailed again at 2.30 p.m on September 10th; and after some difficulties with fog—through which our captain navigated us very well—we picked up our pilot at Ricolada light-ship, and anchored a long way (12 miles?) off Buenos Aires during the night following September 14th.

Next day the tender took us in an hour and three-

quarters to the quay; and, thanks to the presence of my brother and an emissary of the agents, Messrs. Furlong, I got all my things, photographic stores included, through the customs without examination; and soon we were at the comfortable, if somewhat expensive, Phœnix Hotel.

I spent some little time in Buenos Aires with my brother and his family after my arrival, and again spent some ten days there by myself the following June, when I was leaving; so altogether I was able to see and to photograph a good deal.

My recollections of the city from my visit of 1888 were somewhat faint; but two important changes I did notice. The first was in the sanitary arrangements in the hotels; and of this I will say no more than that everything was now as it should be.

The second was in the paving of the streets, and in the trams.

In 1888 all the streets were paved so roughly that no carriage could drive along them save at walking-pace. There were some lines for horse-trams, and all the carriages were built of the right width for these; so that a carriage would trot along, the wheels on the rails, and would have to stop and pull out of the way when a tram came.

Further, the tram-horses were wretched, and one more than suspected that there was much brutality in the way in which they were used—and used up.

In some of the main streets blocks of stone would be missing; and it was quite possible to break one's

ankle, just outside some magnificent-looking hotel, in a faulty place where a shadow from the arc-light—for even in 1888 they had electric lighting—fell.

Now, in 1908, all the streets were beautifully smooth—asphalt or wood, or both ; I forget now—and electric trams of the overhead system ran along practically all. I noticed that the street called the Calle Florida was still, as in 1888, the fashionable town-promenade, and had no tram along it.

But the defect of narrowness still remained; and both trams and carriages ran but one way along each street. In the heart of the town I saw but one wide street, viz., the Avenida de Mayo.

Oh! the noise of the trams! Wherever you go there are these clanking cars hurrying along, trailing an aerial screech behind them. The pavements are crowded with foot-passengers; but you must beware of stepping off into the street to avoid collisions, for a car will be on you at once.

And what a tangled web they weave every hour and minute through the city. Do the conductors know where they are going? I knew one passenger who did not. One day I came back, from a visit to La Plata, to the station called the Casa Amarilla, and took a tram with a view to getting to the lower end of the Calle Cuyo. I tried to make out whether it was the right tram; only the conductor, like (in my opinion) all small officials in Argentina, was not helpful. By looking at the names of the streets and at a small map I found I was going wrong; but the con-

ductor seemed to think I had better get thoroughly wrong before getting right again, and so I finally reached the "Once" station, very far from my destination.

There I consulted one of the small, quiet, dark policemen—(all the foot-police seem to be of some small, dark, olive-complexioned race; an Indian type I should guess);—he gave me some hurried directions and then would help me no further. I got into another tram; *that* was wrong! Shooting out of this I attacked another small dark policeman; again a hurried direction, followed as before by complete unconsciousness of my presence. By chance I wandered to a very "trammy"-looking corner, and there enquired of a third small dark policeman. As his directions were simply *numero veinte-ocho* (No. 28), I did understand; and I soon had the pleasure of seeing the numbers of Calle Cuyo running down from an ambitious 2000 to the modest 337 that was enough for me. I had taken an hour and a half over the journey instead of twenty minutes or less.

As regards the gaieties of Buenos Aires, I can say nothing, save that, in the way of cheap entertainments, cinematographs were much in evidence.

It is, I believe, a city—as Argentina is a country—where only wealth counts. Everywhere there are good shops whose contents argue the commonness of riches and luxury. There are theatres, races; in the park at Palermo splendid motors speed along the broad ways; hurry, crowd, and stir. A city to do business

in, to find gaieties in, to spend money in. Not a city to rest in, not a capital to get attached to; so at least it seemed to a middle-aged Englishman of quiet tastes. I was told by people who admire the country that no man could be distinguished in Buenos Aires save by wealth; that a writer, an inventor, a traveller, a man of law, a politician, has no standing as such. On the whole, I should say, the religion of Buenos Aires is materialism. I was once reasoning with an Anglo-Argentine concerning the value of literature in education. Finally he said, "Well, Mr. Larden, it comes to this; I never knew a man yet who was fond of poetry who ever gained a dollar on the Bolsa (stock-exchange). I think *that* settles it!" I agreed that it did; for what was the use of saying more?

To return. As I have said, I saw nothing of the gaieties of Buenos Aires; but I visited the city of La Plata (some hour or hour and a half distant by train), the Zoological Gardens, various parks, the Botanical Gardens, the Rifle Range, some races (which were much as in England); and, finally, that most important of all national functions, the great Agricultural Show.

First, La Plata. From Buenos Aires you travel over flat country that would be very monotonous, or even (since it has lost its wildness) ugly, but that everywhere, especially around the houses, there have been planted fine groups of evergreen trees of forest magnitude, pines and eucalypti. What a boon,

from the point of view of beauty, the (imported) eucalyptus has been to Argentina! It grows rapidly there in many parts ; though not (I was told) in the open plains inland. Round the houses, too, I saw the smaller kind of palms; but these I believe require even more shelter from wind.

La Plata seemed to me to be a city of the dead, such as was found, deserted, in one of the stories of the Arabian Nights. Splendid public buildings, gleaming white gateways, magnificent avenues and groves—and no houses, no people! That is, the streets were not much better than those of a camp town, lines of scattered houses of no uniformity, and the roads were in a chaotic state.

It was, I believe, planned as a great capital worthy of the important province of Buenos Aires, and was then left unfinished and never adopted by the wealthy classes and by the tradesmen who supply their wants. Buenos Aires remains the capital and centre of Argentina, and also the business capital of the province. La Plata is the political capital of the province of Buenos Aires, and no more. So at least it seemed to me; I give my impressions merely (in this case) as a tourist.

Its aspect gave a curious uplift to my mind after I had been in Argentina some nine months (for it was on my way back that I visited it). Here, at any rate, was one flight of imagination, one aspiration after some ideal of beauty and grandeur, in this very material country. But it seemed to have failed;

LA PLATA : GATEWAY OF THE BOSQUE.

LA PLATA : THE MUSEUM.

To face p. 36.

beautiful in itself, but out of place here as a Grecian statue in a Stock Exchange.[1]

I went first to the Museum, a magnificent building. There I saw, among other things, the shells and skeletons of the huge extinct armadillos, some about 11 to 12 feet long.

It was interesting to note that these monsters, unlike the modern representatives of the race, had rigid shells. The tails were very "weird," and they had joints. [See illustration facing p. 156.]

Giant sloths, too, were there, of still more enormous size. Under a glass case I saw what I was told were relics lately collected, by a British expedition, in Patagonia. I had read that the skin of a giant sloth had been found there, among implements of human origin, and that hopes had been entertained that a living specimen might be discovered. Here was the skin,—there were bones of a sort imbedded in it, making it a kind of cuirass—awls, &c., of human workmanship, and the skeleton of the sloth itself; but no remains of human bodies. No living specimen of the sloth was found. The skeleton was not of the antediluvian hugeness of some of the others; but yet it was about 8 feet long.

Dr. Schiller, Professor of Mineralogy, whom I had met in the Andes, was most kind and hospitable; and

[1] The reader must remember that I visited this practical, prosperous, and advancing country too late in life to take to it thoroughly. One should emigrate to such countries when younger, before one's tastes are formed and confirmed.

all whom I came across were very courteous and patient with my weak Spanish. My ignorance of the subject did not enable me to grasp all that I was told of the connection between sloths and armadillos, and of the gradual changes that took place in the nature of the protective armour; but I gathered that there were such links, and that such changes had gradually, through long ages, occurred. Another very interesting collection was that of existing armadillos; there appeared to be many more than the four sorts that I had come across.

The Zoological Gardens at Buenos Aires were very fine. These belong to the city of Buenos Aires (or is it to the Republic?), and not to a private society, as with us. It is probably for this reason, and because of the relative cheapness of land, that there is a unity of plan and an abundance of space that our Gardens lack. We rightly value our English principle of private enterprise; but I should say that in Latin South-America nothing of this public kind would be done unless the State or municipalities took it in hand.

Certainly everything in these Gardens was well done. The condor cage was a huge erection; in it hawks and even eagles were flying about quite freely, though the condors themselves, with their immense spread of wing, had to be content with very short flights.

An ant-bear was being led about by an attendant,

and was very quaint. But it seems rather hard on it to have been made so ridiculous just in order that it might be able to eat ants.

The *guanacos* (animals of the llama race) were quite delightful. There was a laughable aspect of old-maidish primness and mild displeasure about the animal when he (or she) began to think the visitor (with a camera) a little too observant and somewhat lacking in good manners. Sometimes, again, they would come quite close and regard me with a very gentle and bright-eyed curiosity. Of their spitting habits I had no experience.

Of the fine lions and tigers, the elephants (including a baby-elephant, born in the Gardens), and a very lofty giraffe, of tapirs, pumas, jaguars, carpinchos (the largest existing rodent, I am told), and of the many other animals to be seen there, all in full health and animation under the warm Argentine sun and clear sky, it would take too long to tell.

The Botanical Gardens well repaid a visit. To me, no botanist, the great beauty of these Gardens lay in a picturesque building of rough brick, very mellow in colour, that faced the entrance-gate. From all points of view it and its attendant palms and other trees and shrubs had a most attractive appearance. Indeed the soft, dark-red Argentine brick, usually put together with bad mortar (if not mud) that soon wears away and leaves a rough surface, is a most picturesque building material; it might take an English brick house some two hundred years to look as old and as

mellow in tone as does an Argentine house in twenty or even fewer years.

The Parque Lezama too, though small, was very beautiful; ,and here again the red brick played its part.

The magnificent Palermo Park, with its broad drives, its trees, and well-watered lawns, is a great feature of Buenos Aires and a grand possession for the city ; but it hardly lends itself to description.

One day a young Englishman, born in the country and therefore liable to military service, took me to have some rifle-shooting at the great city range. There were innumerable targets of all sizes, but (I think) none disappearing and none moving. You could borrow a rifle (a Mauser made in Germany, but with some slight modifications ordered by the Argentines) and buy cartridges at $1 paper (about 1s. 9d.) per twenty-five; there were no fees to be paid, and all was well arranged.

But so far as I could learn about it from my companion—an Argentine, legally, as already stated—the military system in Argentina would appear to be very slack. He had had six months' training some eight or nine years ago; that was all. He said that men were supposed to keep up shooting; but he had never shot since, and had not been "run in." As to periodical drill, that was not even in theory provided for. If his case was typical, an Argentine army would be little better than a mob of men with rifles. So I put down Argentina as another nation that would do well to consider Switzerland's system.

IN THE PARQUE LEZAMA, BUENOS AIRES.

GUANACOS IN THE ZOOLOGICAL GARDENS, BUENOS AIRES.

To face p. 40.

But *the* sight in September was the great Agricultural Show; that, watched year after year, affords a good means of measuring the progress of the Republic. For, so far, Argentina's wealth lies in her soil. Of what I take to be the main cause of this enormous progress I shall speak later.

Here were now to be seen bulls worth from £500 to £3,000 each; Clydesdale and other draught stallions worth £300; rams from £8 to over £200; and, as a sign of wealth, racehorses up to £3,500. There were all sorts of pumps (for watering the stock) worked by windmills or petrol engines; cutting, loading, and threshing machines of the latest pattern; mechanical shearers; locust-destroying machines; ingenious arrangements with sliding doors for working cattle speedily and without injury—in some cases doing away with the old rough methods of lazoing and throwing the poor animals; wire-fence menders; everything, in fact, that has been devised for advanced farming and stock-rearing.

So here, in the vital centre of the Republic, I could see at a glance how the country had been transformed since I had last seen it. Of the actual changes I was now to get a closer view; for our stay in Buenos Aires was over, and we were off next day to the estancia away in the province of Santa Fé, some eight hours distant by train, where I had stayed twenty years before. I remembered well how things were there then; and anticipated much interest in seeing how matters stood now.

CHAPTER II

HISTORY OF THE ESTANCIA SANTA ISABEL—FROM BUENOS AIRES TO THE ESTANCIA—FIRST IMPRESSIONS AS REGARDS THE CHANGES AND PROGRESS VISIBLE EVERYWHERE

I WILL now say something of the origin and history of the estancia that I was to visit once more after this long interval. In the year 1882 my brother was asked by the firm of Drabble (now converted into, or absorbed by, the "United Estancias Company, Ltd.") to hunt up the boundaries of, and to report on the capacities of, a piece of camp of six square leagues (about 60 square miles) that had fallen into their hands in 1857, and to which they had paid no attention since. And rather later he received an offer from them to manage it on shares (a system still in vogue, and affording to capable and hard-working men of negligible capital the best means of acquiring wealth); they, of course, supplying all the money required for fencing, building, and stocking. It lay some 100 miles from Rosario de Santa Fé; there were no fences round it nor any between it and Rosario; all the country was open; all was wild camp, haunted only a few years before by Indians.

HOW SANTA ISABEL BEGAN IN 1883.
(From a sketch taken in 1889)

SANTA ISABEL IN 1888.

To face p. 42.

So he went down with some peons and arranged with fencers; living for a time in a covered cart, and for seven months in a turf hut. Many a time had he great difficulty in hitting off this dot in the vast plains when returning from a solitary ride. This hut was actually standing in 1888 when I paid my first visit; it was buried in the *monte* (or grove) of peach-trees, and was used as a hen-house. But I sketched it with my brother leaning up against it, abolished the *monte*, put in a sunset—and there I had the lonely pioneer beginning his work!

I may mention here that he found *gauchos* and others squatted on the land, and had to turn them off. One man, of a superior class, occupied some 15 square miles; he could not be got rid of for many years, as there was a dispute as to boundaries. But at last, after a wearisome lawsuit, he, too, went.

Gradually fences were put up, stock bought, brick buildings erected, wells dug; and before long there was a fenced-in property with its estancia-house and its staff of men.

So when I visited Santa Isabel in 1888 I found a dwelling-house of brick with three good rooms, offices, outbuildings, peons' quarters, and all that was necessary for the comfort of an unmarried man accustomed to the camp life of the earlier days of estancias in Argentina. This little house, shown in the illustration, still forms the core of the much larger and more luxurious home of to-day. But things were then in the rough. We had no milk nor butter, since there

was no one who understood dairy-work; there was hard biscuit instead of bread, since no one there could make bread; vegetables were a delicacy unknown save when, in the suitable season, pumpkins happened to have been sown and to be growing somewhere (for there was no gardener); and our meat was the flesh of cows or sheep too thin and tough to sell! We got up before sunrise, and went to bed at 10 p.m. My brother, judging by a still rougher standard, by his earlier experiences, considered this "luxury"; I did not!

There was a fence round the 60 square miles (or rather round 45 of them, since 15 square miles were still occupied by the native mentioned above), and only about one fence across the property. And, save for a patch near the house and a bit near a puesto, there was no alfalfa; all was native grass, of one sort or another, that was poor food even in summer, and in winter very bad; nor could hay be made of it. But the picturesque element was not lacking, and I used to enjoy this. For there were, inside the ring-fence of the property, various smaller lagunas carrying duck of several species, and in the lower-lying parts one often roused flights of birds, looking like snipe, very good to eat; while, when once I had passed outside, all was open camp right away to the furthest limit of my rides, viz., to Melincué, the camp town some 16 miles off. In this vast outer region there were larger lagunas, fringed with pampa-grass, where swans, flamingos, spoonbills, ibis, egrets, duck of all

sorts, and many other birds were to be found; and I was free to shoot anywhere. *That* aspect of Argentina—the unspoilt Pampas—I thoroughly liked.

As regards material prosperity, at the time of this first visit, not much could be said; the cattle and sheep were of a poor sort, and very little money came in.

Such was the Santa Isabel that I remembered.

Well then; on September 22, 1908, we set out from Buenos Aires by train for "home." In the plains of Argentina it is much as at sea; around you is the sharp circle of the plains, moving with you. I always felt that one should say, "We left such and such a place, and after so many hours in the plains" (as "at sea") "we reached our destination."

It was much the same in this respect in 1908 as in 1888; but now there were fences everywhere. Everywhere alfalfa instead of native grasses, and everywhere *thistles*—looking like a canker on the new civilisation. All wildness was gone, and the monotony was more oppressive than ever to a mountain-lover. I was, however, glad to see whole flocks of ostriches (the *rhea*); these, it seemed, were preserved by some for ornament, by others for a small profit. For the feathers are used for fly-brooms or dusting-brooms; and the right to pluck the birds once a year is sometimes given to makers of these brooms for an annual payment of about $4 (about 7s.).

Travelling was comfortable, but terribly dusty work;

long dust-coats of thin material were the usual outside-wear for men. I may add that the meals on board the trains are satisfactory ; that all respectable people have to travel first-class ; and that berths for night journeys can be obtained for a moderate extra payment.

In the afternoon we reached the station of Villa Cañas, a typical camp-town distant some 15 miles from the estancia.

They are queer places, these camp-towns! Remember that there are no trees in these flat plains of alluvial soil, save such as are planted ; that such a town has to become fairly big and important before its municipality thinks of rendering it less ugly by such planting ; that the inhabitants don't care twopence—so it seemed to me—for the graces of life ; that there is no stone anywhere, so that the streets are deep in mud or dust according to the season ; that extra buildings with galvanised iron roofs are rigged up anywhere and anyhow ; and that streets are dusty tracks bounded by irregular lines of detached houses ; that dead dogs and the like are left *in situ* until some policeman is ordered to tow them away and leave them somewhere further off. Remember—but you cannot remember what you have not seen! Perhaps, however, I have said enough to suggest the unkemptness, Godforsakenness, and dreariness of a small camp-town on a windy day! I have seen the dust above Melincué from a distance of 18 miles.

Of course, in photographing streets in these towns

TYPICAL STREET IN A CAMP-TOWN.
(Melincué, F.C.C A.)

To face p. 46.

I went where there were trees, and I chose the best points of view; I could not immortalise the ugliness! Hence the scenes were idealised in my photographs.

A curious feature of the houses—which, by the way, are all one-storied—of these smaller camp-towns is that they have sham fronts; that is, the side facing the street is built up, so as to look more imposing, the roof behind it being at a lower level. And, since the houses are as a rule disconnected, you see them sideways as you walk up the street, and discover the fraud.

One beauty, however, they have, and that is *colour*. And the splendid Argentine sun, as evening comes on, lends to all this ugly mixture of dust and brick buildings a glory that is quite startling. And my nature, that seemed weighed down by the hot and ugly reality of the noon-day, used to revive when I felt the cool air of evening and saw everything idealised in the sunset glow. Truly the contrast was marvellous, and, as each day closed, the whole scene was transformed.

The inns, or fondas, of these minor towns seemed to be all much of the same type. Most of those that I saw were corner houses, one-storied of course. You entered by the bar, which was also a restaurant for peons and others of the lower classes, unkempt and swarthy men, who sat about drinking and playing cards. Beyond a screen lay a more private salle-à-manger. A door from this led into an open yard or patio, round which ran the bedrooms. Food and

sleeping accommodation might be tolerable, or even fairly good (only you must not mind a taint of garlic in everything); but in one respect, not unconnected with sanitation, reform is much needed, and until there is a change no Englishman (I cannot answer for other nations) would willingly spend twenty-four hours in a fonda. In 1888 things in this respect were nearly as bad in the otherwise luxurious hotels in Buenos Aires.

But all this time we are waiting at Villa Cañas station. Here it was evident at once that my brother was at home. In Buenos Aires the estancieros who have come in from the plains to have a good time are nobodies relatively to the wealthy men of business of the city; unless, indeed, they belong to some well-known family of enormous wealth, and are living as owners on one of the family estates. But here, out in the "camp," the estanciero is a big man! We were met by a covered wagonette (or volanta) drawn by four horses for ourselves, and there was one of the huge two-wheeled wagons for my big chest and numerous other pieces of luggage, and all that of my brother and his family. Our coachman was a good-looking young peon with a marked strain of African blood in him, and the African love of smartness and brightness of colour in dress was much in evidence. He was, I learned, one of the more confidential peons (peones de confianza). Such men, even though they hold no permanent or highly-paid post on the staff of the estancia, are trusted to

ride into town with, or to fetch, considerable sums of money. In Argentina it is not the gaucho class that is untrustworthy.

In 1888 my drive from Melincué had been over open camp, through the tall native grasses; we saw no fence until we reached the estate.

Alas, for the change! Prosperity had come, and romance had gone for ever.

We now drove between wire fences along what are called "roads." Two fences are run some twenty to fifty yards apart (it varies in different parts and even over different reaches of the same road), and all traffic has to go between them. There is not the smallest stone in all the vast alluvial plains of Argentina, and it can be imagined to what a condition of dust such "roads" are in general reduced in the more normal, dry weather, and what impassable depths of mud are found in the hollows during, and long after, one of the rarer periods of rain. When a road *is* "made" (as in a camp town, or across some bad, miry place) it is only made with earth, and in general it is not made at all. So, in a cloud of dust, we drove along. To either side now, instead of the wild prairie, lay fenced paddocks of alfalfa, in which cattle of quite a new and well-bred appearance lazily fed or stood replete and idle; or else I saw vast sheets of linseed, maize, or wheat, indicating a colonist's holding. And the same changes were visible when we passed inside the boundary fence of Santa Isabel. All looked prosperous, and suggested wealth-making; but I

must confess that my heart sank a little as I wondered what I could do each day, with the resources of open camp and lagunas thus vanished!

But there could be no feeling other than that of pleasure in seeing the changes effected in the house itself. Rooms had been built on, pictures and trophies were on the walls, good furniture and comfortable chairs abounded; the bachelor's living-place had disappeared, and there was a home instead. There was a garden and a Swiss gardener, and some little dairy-work was done. Of the increase in prosperity and work there was also much evidence in the huge new galpon, with its upper story for grain and wool; in the blacksmith-carpenter's workshop, made out of what had been a sufficiently large galpon in 1888; in extended peons' quarters and other offices; and last, but not least, in the significant presence of an English gentleman acting as book-keeper; the accounts, which my brother managed himself in 1888, being now far too much for any estanciero to see to.

One more change must be mentioned before I close this short account of my first impressions. Everywhere, both in the little town of Villa Cañas and to either side as we drove along, I noticed an entirely new feature; the sentinel-like forms of the windmills now used all over Argentina for pumping water into the reservoirs that supply the houses or feed the drinking-troughs; tapering columns of open iron-work some 30 feet, surmounted by the untiring vanes.

CHAPTER III

THE ESTANCIA SANTA ISABEL IN 1908; CHANGES AND PROGRESS—STOCK AND CROPS

SOME years after my visit in 1888 the flood of Italian colonists, spreading outward from Buenos Aires, had reached Santa Isabel; and it had been through them that the changes had been brought about.

The land was let out to them, ten square miles at a time, and what they found as rough camp, they left as alfalfa pasture. Better stock was introduced, the camp was subdivided by fences, more care was taken in breeding; and so, in a very short time, the profits of the estate rose by leaps and bounds. I will give some figures.

I. **In 1888,** on 45 square miles of camp (the other 15 square miles being "in the courts" as mentioned above), the stock was as follows:—

1. *Cattle.* About 5,650 cattle of "native"[1] breed;

[1] Cattle, horses, and sheep were none of them really native to South America. But the stock introduced by the Spanish conquerors gradually adapted itself to the coarse pasture and rough life; it became hardy, but, from the stock-raiser's point of view, degenerate. Stock of this sort is called "native" or *criollo.*

yearly sales some 400 picked animals at about £1 12s. 6d. each. I remember that cattle *could* be picked up at an average price of 14s. each!

2. *Sheep.* About 1,200 "native" sheep; the sales each year about 120 at 5s. each; and the whole of the wool hardly brought in more than £100 annually.

3. *Horses.* About 425 horses and mares, mostly "native." A half-breed Cleveland stallion was beginning to improve the race. Annual sales about 35 tamed and trained riding horses (they cost something to be broken in) at about £4 each.

I remember that quite good riding horses *could* be picked up at 30s. each. Mares hardly counted then; some were sold at 12s. each. If a prairie fire had to be put out, some native estancieros would have a mare killed and its body dragged over the smouldering belt to extinguish it. Even at Santa Isabel I remember that, fuel for branding having fallen short, two mares were killed that their grease might be added to some dry bones to make these burn. [This occurred in 1889, during my first visit.]

4. *Agricultural produce.* Practically none; certainly none for sale, and not enough for home consumption.

II. **In 1908,** on 40 square miles of camp (the other 20 square miles being under colonists) there were:—

1. *Cattle.* 9,000 of good breed, Durham chiefly. The yearly sales about 1,400 to 2,000 at about £9 5s. each. [The value has risen since then.]

2. *Sheep.* 10,000 of good breed, merino chiefly. Yearly sales, some 2,000 at 17s. 6d. each; and about 64,000 lbs. of wool at $7\frac{7}{10}$d. per lb. (more or less).

It will be seen from this item what an enormous impetus has been given to sheep-farming by the substitution of alfalfa for the coarse native grasses which the sheep could not eat. [The advance of agriculture, however, in the older camps has acted in the direction of *reducing* the number of sheep in the Republic, as is noticed on p. 304.]

3. *Horses.* Some 630 to 640 mares and horses, the Cleveland strain predominating. Yearly sales, about 170 mares and *untrained* colts together, the mares fetching £6 10s. each and the $1\frac{1}{2}$-year-old colts £13 12s. each. Since 1908 some picked colts of $2\frac{1}{2}$ years instead of $1\frac{1}{2}$ years were sold at about £23 each.

4. *Mules.* Formerly none, now about 90. They are very large, the offspring of Spanish jack-donkeys and big mares of Cleveland strain. In 1907 about 60 of $1\frac{1}{2}$ years were sold at £13 12s. each; since then some of $2\frac{1}{2}$ years at £23 each.

5. *Agricultural produce.* The estancia drew from the colonists on the 20 square miles, without any expense, one-quarter of all the produce as rent. When the colonists, after holding the land for four years, were about to move on, the estancia at its own cost sowed alfalfa with the colonists' last crop; that was all. The colonists had ploughed and prepared the land.

Such were the enormous changes produced by the

flood of Italian immigrants when they had reached Santa Isabel and had been at work for a considerable time.

The question of water-supply in the plains is one of great interest, and I must make a digression here that will explain the presence of the windmills that now form such a striking feature of these flat and treeless plains.

In old days there was for the house the poso or common draw-well worked by hand, and the cattle went to drink at the shallow lagunas that lay in the hollows of the plains. [A "poso" is seen in the second illustration facing p. 42.] The best land however, does not (save in the sandy provinces, which were not occupied earlier) lie in the hollows, and for this and other reasons wells were dug and drinking troughs constructed on higher land at suitable points. [I may mention that it is extremely undesirable to have a drinking-place in a hollow, since the cattle tread this into a terrible morass in wet weather.] Of course, in Argentina, horse-power being abundant and machinery difficult to get, a horse and rider were at first employed to draw the water. Such wells are called jagüels, and are still in use. When the wheel-and-axle principle is made use of, in which case the name "*cilindro* jagüel" is given, a very large bucket can be employed. In all forms the tipping and emptying of the bucket is automatic.

Next came the noria, an elaborate piece of

A CILINDRO-JAGÜEL.

A NORIA.

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machinery. In this a horse or mule, blindfolded, goes round and round and works an endless chain of buckets that dip into the water below and empty it into the reservoir or drinking trough above.

In 1888 I saw nothing in advance of the noria.

It was inevitable, however, that wind should be used sooner or later, and there were countries quite ready to export windmill pumps to this new market. And with this introduction of windmill pumps came in also the semi-artesian ("semi-surgente") wells, the need of which had already been felt in connection with jagüels and norias as the water-level fell year by year. For, whatever the cause, whether it be due to the introduction of alfalfa (as some think) or due to some general climatic change, the water-level has fallen and is falling. On Santa Isabel, as far as I could ascertain (and I could *see* the fall in the case of one well that I remembered), it had fallen from about eight to about twelve yards below the surface since 1888; and in the far-distant province of San Luis, where the level of a well dug at my brother's homestead is now three yards, it was much less seven or eight years ago. Everywhere, too, lagunas are drying up.

Well, though the wind on the plains rarely fails for long together, yet it is necessary to take advantage of breezy days to fill up the big reservoirs. But it was found that the wells, even when excavated right down to a hard, impermeable layer that underlies the alluvial soil and the fairly soft stuff below it, soon ran dry.

If, however, this hard layer be pierced a new supply of water is tapped. This will not rise to the surface, but only to the same level as the surface-supply takes up, and therefore the well is called "*semi*-artesian," not artesian. [I should say here that the supply lying *above* the hard, impermeable layer is called the "surface-supply."]

At Santa Isabel an ordinary well is dug until the water stands some 2½ feet deep in it. Then a narrow boring is run down through the hard layer until the lower supply is tapped, and this boring is lined as far as is necessary to prevent it from falling in, but not further; it keeps full better when not lined. The tube of the pump runs down into this narrow boring for some feet, so as to obviate still more completely the chance of the supply temporarily running out, since the level sinks during the pumping.

With jagüels, norias, and windmills the best plan is to have a raised reservoir that keeps the drinking troughs full by means of a float-valve. These reservoirs are usually "Australian tanks"; the bottoms are as a rule of stamped earth and the sides of corrugated galvanised iron, which is banked up with earth outside.

I may mention here that everywhere I found the water saline; I believe that the salts are mainly sulphates, chlorides, and carbonates of calcium, potassium, sodium, and magnesium. And certainly the "semi-surgente" water is much more saline than the old surface-supply.

One of my first bits of work was to master the new geography of the 60 square miles. This had been a simple matter in 1888; for there was but one main fence inside it, in addition to that cutting off the disputed 15 square miles, and all was rough camp of one quality.

Now, however, there were fifteen enclosures of 1,600 acres each, another such divided into four, some smaller pieces round the homestead, and two blocks of 6,400 acres each, distributed among colonists whose houses (or huts) I wished to be able to localise. When I went out into one of the big paddocks and mounted a windmill, it was curious to see how all this work of man disappeared! Looking north, south, east, and west from a height of 25 feet, all seemed still one vast empty plain; fences were not visible, and the homestead itself, with all its spread of buildings, plantations, and corrals, though really not far off, became a merely unnoticeable roughness on the horizon.[1] And still, at night, the setting sun was cut sharply by the horizontal-line of the horizon.

Round the estancia itself some of the changes were

[1] In the illustration showing one of these views, the part in the foreground is that trodden bare by the cattle and sheep that collect round the drinking troughs. The rest is alfalfa, which had taken the place of the native grasses. Through this alfalfa the sheep make pathways, after their manner. As regards the sunset shown, I may say that, in developing the negatives, one has a choice. One can develop so as to show a well-defined disc cut across by a sharp horizon-line; the sunset

interesting. Some years after my first visit the locusts began to come, and they have rarely failed since then. So the big peach-monte disappeared first of all, and willows and acacias were substituted. But these too are doomed; and soon there will be left only the paraiso-tree, which locusts will not eat. Fortunately this is a beautiful tree, bearing flowers in springtime and berries later on, with leaves of a pleasing form and of dark green colour; there is nothing of the gray look about it that the native trees in the province of San Luis have.

The shape of the paraiso is something like that of the hedge-row oak-tree, only more delicate; beautiful rather than sturdy.

Small birds had increased in number and variety to a most extraordinary extent, and nesting was in full swing. Their tameness was—not "dreadful" but — delightful. But why did some misguided person introduce the house-sparrow? Evidently it finds the country a paradise; and, grossly parodying the tameness of the native birds, it has become shameless. It pulls everything to pieces that it can, attacks other birds' nests, chatters incessantly everywhere, and robs caged birds of their food in the very veranda. I could not keep my dark-room

looking as it does to the eye when viewed through a very dark glass. Or one can develop (as here) so as to give the impression of a dazzle, and so that the glare of the sun appears to invade the horizon as it does to the naked eye unprotected by a dark glass. In this case the "invasion" is an irradiational effect, chemical on the sensitised surface, and retinal in the eye.

THE PAMPAS, SOWN WITH ALFALFA.

SUNSET IN THE PAMPAS.

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light-tight because of these pilferers; they pulled the stuffing out of the cracks.

I noticed too the great growth of the peons' quarters, and the greater bustle of work. There were more corrals; and I saw the "manga," a fenced gangway with sliding doors for handling cattle, and the long sheep-dipping trough of Portland cement. There was a big fowl-yard now; and the numerous hay- and silo-stacks spoke of a provision for the winter that was nearly unknown before. The cattle, too, were not only of quite a different and improved breed, but were amazingly fat. One curious change was the extensive use of barbed wire; it was remarkable to me that the animals could have learned to keep away from it. Injuries, however, do occur sometimes.

There was, of course, now no free galloping over the prairie; one passed from paddock to paddock through a series of gates.

To my brother, after his long years of hard life and unprofitable work in past times, all this was a source of delight and content, not unmixed with the natural pride of the pioneer who has transformed waste lands into a prosperous estate. But—I must confess it!—I regretted the old wild camp; and it was with some sadness that I saw vanish my dreams of days out among the bird-life of the lagunas that were now either dry or forbidden to me by the formerly-unknown law of "trespass"!

CHAPTER IV

THE POPULATION OF ARGENTINA—MEANING OF THE WORDS "NATIVE" (OR "CRIOLLO") AND "GAUCHO" —THE "NATIVE" PEON CLASS AND THE ITALIAN COLONISTS IN THE PLAINS

In this book I am recording my experiences in the "camp," and am not dealing with the towns; I am describing what I saw of the industries of agriculture and stock-raising, and of the progress made since my last visit, and am not touching the subject of railway enterprise or of business and commercial activities in Argentina.

For this reason I shall say little or nothing of the foreigners (English, French, German, &c.), who, however important financially, do not come under one's observation when one is studying the life on an estancia. I shall confine myself mainly to two classes, viz., the native peons of the gaucho class, who are employed in all work with cattle, horses, and sheep, and the colonists (nearly all North Italians) who are transforming the country by their agricultural industry.

But I must first explain the meaning of two

words about which there appears to be much misapprehension and confusion.

The word "Criollo," or "Native."

It cannot be too strongly insisted on that, on the whole, the dictionary meaning of the word *criollo* (which Anglo-Argentines translate into "native") is the true one, viz.: "*one born in America or the West Indies of European parents*"; neither it, nor the corresponding French word, *creole*, imply the admixture of dark blood. An English lady who told me that her children were "creole," because born in the West Indies, was using the word rightly; and the old French creole aristocracy of North America would have been horrified at the idea of having negro blood in their veins.

In Spanish America the word was used to distinguish the colonial-born from the Spaniards born in Spain; and I speak in Appendix I. of the more or less political reasons for the distinction being a real one as regards interests. It is true, however, that in all the Spanish colonies the criollos (or "natives") did as a rule have dark blood in them; the reason for this being that Spaniards did not in general take women with them; they colonised through men, and not through families. Hence one finds that there is much Indian (and sometimes negro) blood in practically all of those who belong to the lowest classes, and in many of those who belong to much higher classes. The word is never

used of the aborigines; and, up to the present time, it is not used of any persons born in South America whose European blood is not Spanish. Thus, my brother's children, born in Argentina, are legally Argentines, but would not be spoken of as criollos, or "natives." I have come across a German born out there whose language was Spanish and whose proper name, Buchholz, had been transformed into the Spanish shape Bujón; but even he was not regarded as a "native." When used in an adjectival sense, however, the word has a wider meaning. If anything of a specially Argentine sort, as lazoing, or riding, or using the boleadoras, be done very well, a spectator might murmur "*muy criollo*" ("very native") as he applauded; and an Englishman or Frenchman who had adopted the ways of the country and talked the idiom well would be similarly characterised in an adjectival way.

The word "Gaucho."

The true "gauchos" are, for all practical purposes, a dying or extinct class in modern Argentina. They were the "natives" of the plains; colonial born, and therefore almost inevitably half-breeds (though the name, like "criollo," does not imply this); horsemen, hunters, owners of horses and cattle, and quite averse from anything like patient agricultural work; illiterate, half savage. They were a class, not a race in any strict sense, as were also the old trappers of North America. In the vast unoccupied

Photo] [*H. N. L.*

GAUCHO, OLD STYLE.
(From a photo taken in 1869.)

NEW STYLE : CAPATAZ, OF GAUCHO-CLASS, IN 1908.

To face p. 62.

plains any gaucho could make his hut and settle—as far as he cared to settle; and as the land was bought up and the owners came to raise stock, the gaucho moved on. Sometimes he would, without losing his independence, undertake to break in a tropilla of horses; or—but this was the beginning of the end—hire himself out temporarily for cattle-work.

Inseparable from the gaucho was his characteristic dress and horse-gear; and the latter persists still. A shady felt hat with a handkerchief under it that protected the back of the neck, another handkerchief round the neck—(even now the peons muffle themselves up round the throat in what appears to us to be a very unnecessary way)—a "poncho" (the oblong piece of flannel or of material woven out of guanaco or vicuña hair, with a hole in the centre for the neck, that served as a protection from cold and wet), the "chiripá" (a sort of shawl or poncho tucked into the belt and covering the waist, hips, and thighs), linen drawers, and perhaps boots of untanned horse-hide—such was the nature of that part of the dress that could be seen. One had a general impression of loose drapery. But I believe that instead of the very loose nether-gear described, even a true gaucho *might* wear the baggy trousers, buttoned in at the ankle, called "bombachas."

I must not, however, omit to mention the "tirador," a very broad belt, containing pockets, usually covered

with silver coins. I have seen them made of the thick and soft carpincho leather. Into this belt was stuck, at the back, the huge knife equally characteristic of the gaucho class. As regards the horse-gear, I describe this in Chapter VI.

The gauchos, as I have said, were a class, and not a race. If a gaucho's son adopted other ways of life and other dress, he would cease to be a gaucho, though, of course, he would still be a criollo. And, on the other hand, I think that a pure Indian, if he had joined the gauchos and had adopted their ways and dress, would have been called a gaucho. But of this I am not sure.

Like the word "criollo," the word "gaucho" is much used adjectivally. An Englishman would be called "muy gaucho" if, in language, dress, horse-gear, and skill with cattle and horses, he more or less resembled the gaucho.

I will now return to the subject of "Natives and Colonists."

Of the natives in the big towns—politicians, professors, men of law, merchants, doctors, men of business—I know nothing. From what I saw they were much like what one would expect colonial Spanish to be; and signs of admixture with Indian blood, which I suppose occurred to a considerable extent in far-off days, had apparently vanished. I should guess that nowadays society in Buenos Aires and Rosario and other large towns is much mixed as

regards race. Italians, Spanish, Germans, and immigrants from Uruguay and other South American republics, if of the wealthier classes, all appear to aim at dressing in the latest European fashion; and, since they as well as the wealthier "natives" speak (or aim at speaking) proper Spanish, discarding Argentine peculiarities of pronunciation, a visitor like myself would hardly notice, in these "upper classes," any sharp line of demarcation between natives and such foreigners as were of Spanish or South American nationality; or even between natives and foreigners in general, provided that these latter were dark and spoke Spanish well.

In the fashionable street called the Calle Florida I saw no characteristic Argentine or even Spanish dress. The ladies' dress suggested Paris.

Passing to the small camp-towns, one may say that the inhabitants are in the main native. Here the official and business classes (including innkeepers and shopkeepers) all appeared to me to talk Argentine-Spanish; but their dress was quite European. Among the lower orders I saw many of the gaucho class, wearing such remnants of the old gaucho dress as have survived in these times of change and modernisation. Perhaps these had come in to shop.

In passing, I may say that I was *not* favourably impressed by the smaller Argentine officials—those of the lower middle class. Station-masters, post office clerks, tax-collectors—all appeared to me to be singularly devoid of any desire to be obliging and

helpful. To this lower middle class the provincial priests and doctors also appeared to me to belong; and I should say that they also, as a whole, are (to say the least) somewhat unattractive. I heard from persons directly concerned many stories of the extortionate conduct of the doctors of these small towns; and I came across one such case myself. Of the priests—excepting those of Irish nationality—I heard no good. It was noticeable that all reports tended in the same direction; and so I came to the conclusion that it was a case of "no smoke without fire." Well, if the stories had truth in them, one must conclude that (to put it very mildly) neither country priests nor country doctors in Argentina do, as a class, play the part of friends to the poor, nor tend to raise their standard of right and wrong. I will leave it at that; and I do not think that Anglo-Argentines, who are "camp" men, will consider that I have been unfair; though of course there are exceptions in every class.

I will now pass from the cities (of which, as I have said, I know next to nothing), and from the camp towns (where no one would wish to stay), to the open camp itself; to the true Argentina of whose wealth and progress we hear so much. Here we have, scattered over the vast plains, estancia after estancia, each in the centre of a huge property where stock is raised;[1] here too we have the tenant-colonists with their relatively small holdings and their crops.

[1] See note at end of this Chapter, No. (i.).

Passing over the proprietor or manager and his mayor-domo, who, as likely as not, will both be Englishmen, one may say that the population in the "camp" is composed of two distinct classes, who are also of two distinct races. These are, as I have said already, the peons, "native" by race, who deal with the stock; and the colonists, mainly North Italians,[1] whose work is agriculture.

First let us consider the native peon. He represents the gaucho-class of older days, but has changed in more than one way. In the first place he has lost his independence: he is a paid servant, lives in quarters provided for him, and is practically under orders for twenty-four hours in the day. Inevitably the old free gaucho spirit has nearly disappeared. Further, his dress has become modernised. The horse-gear (described in Chapter VI.) remains the same; but otherwise the modern peon on horseback is very unlike the old gaucho, as may be seen from the illustrations opposite p. 62.

In 1888 I did see ponchos and chiripá and other parts of the gaucho dress worn by my brother's peons; and very picturesque many of them looked. But to-day, caps, coloured sweaters, and other modern articles of dress prevail; and one can only be sure of the tirador and knife. Baggy trousers tucked into the boots, or even bombachas, are still common, but ponchos appeared to me to be rare, and the chiripá, if worn at all, was only worn about the estancia.

Certainly there is a falling-off in picturesqueness.

[1] See note at end of this Chapter, No. (ii.).

But I think that there has been a vast gain in what is of far greater importance.

As first known to the estancieros who employed him as peon on their cattle runs, the gaucho was a hardy fellow; capable of sleeping out of doors even when there was a frost, and that without grumbling; quite content with meat and yerba only as rations; working often from before sunrise until dark; understanding thoroughly the handling of horses and cattle, though in a crude and perhaps even brutal way; generous, I am told, to his fellows. He was in the main a good servant as regards the rough work for which he was wanted, and his labour was cheap; further, he would not in general rob his employer. But he was ignorant, very stupid where mechanical appliances were in question, full of strange oaths (obscene in nature); not the sort of person who could be allowed to come into contact with the estanciero's family. There was a vast gap between him and his employer; he could hardly be, and certainly was not, treated with the kindly familiarity with which a proprietor in one of the older countries can, and often does, treat his farm hands.

What else could you expect? These men had never entered a school; priests and doctors were known to them for the most part (I have been given to understand) as extortionate exactors of fees; and they were housed disgracefully, a whole family, perhaps, sleeping in one room. Speaking still of the old regime, when the estancieros were for the most

part either natives or bachelor Englishmen who had themselves been trained (only it was *not* training!) in the rough pioneering school, I think one may say that the peons were left to themselves; no one cared for their women and children in illness; no one troubled himself as to whether the woman of the puesto were wife or not. Even as late as my visit of 1888 I should say that this state of things obtained at estancias of the older school; and I well remember the gap that yawned between us and the peons; I was warned not to try to learn Spanish by talking with them. So it was that during my first visit I received the impression the gaucho class, as represented by the camp peons, was of a low type and not intelligent or adaptable enough to be of use in helping on the development of the country.

In my visit in 1908–9 I noticed a great change for the better.[1] Even at Santa Isabel, which came into existence under the old regime and therefore had

[1] Even in 1909, however, I found "education" weak among the peon class.

I here give a letter from a puestero's wife. The drift of it is (she washed for me) that she apologised for the state of the white shirts and collars, and said she would do the other things for me as before, but would no longer attempt starching and ironing.

"*Señor Don Learden tenga la bondad de disculpar el planchada no lo puesda aser mejor le dire Vst que yo le puedo segui lavando me* [= mas = but?] *no el planchado no no me animo asies que si Vst esta conforme seguires S.S.* "*F. A.* — ——"

I was pleased that I was able to interpret this!

changed but slowly, the difference was marked. I found peons trusted more; I found them digging wells, making terraplanes, building stacks, driving sowing or reaping machines. I noticed also kindly relations between them and the child of the estancia; and I myself found more than one quite companionable when acting as my coachman.

The head man, or capataz, who was chief under my brother (or under his deputy and understudy, the English mayor-domo), had a strong strain of Indian in him; but he was a most reliable man, and gentle and courteous in manner. [See illustration opposite p. 62.]

Another man, Gomez, was markedly Indian in type. He certainly looked like a murderer when he was being photographed; but his face lit up wonderfully when you "got at him" suitably; and he was, I believe, a warmhearted man and fond of children. He was, too, very adaptable; you could turn him on to anything. [See illustration.]

Our usual coachman (properly a cattle peon), mentioned earlier, was of the Spanish-negro type, and was of agreeable and quiet manners. His race must have been very mixed, for his brother was decidedly Spanish-Indian in aspect.

At a new estancia that I visited, where everything was being started on the basis of modern ideas, I saw still clearer evidence of improvement. The first sign that I noticed was the change in the puesto. [See pp. 85, 312.]

CATTLE-PEON OF GAUCHO-CLASS, IN 1908.

PUESTO (OLDER STYLE) AND PUESTERO, IN 1908.

To face p. 70.

The old style of puesto (such as still existed at Santa Isabel in 1909, and is shown in the illustration) was a two-roomed hovel of brick. When the family was large and long, so that the elder children were grown up while the youngest were babies (it is a prolific country), the condition of things inside must have been such as one does not care to consider closely.

But, on the quite modern estate spoken of above, the puestos were nice little houses of several rooms, and were provided with a veranda. And I was surprised to find that the "plough-capataz," or head of the ploughing that was there carried out on a very large scale (for alfalfa was sown without the intervention of colonists, a matter that will be explained later), was a native of the old gaucho class. Verily the gaucho forefather would have turned in his grave had he known that his descendant was walking behind a plough.

Beside the variety of work that is starting into existence everywhere, there appear to be two new influences that tend to raise the gaucho class in the scale of civilisation.

Firstly, the cattle work is being humanised. The animals are no longer knocked about as they were; they are too valuable. They are now, to a large extent, handled by means of ingenious devices in the way of sliding gates, &c. Hence the peon's work is far less brutal than it was.

Secondly, there is growing up more of the patri-

archal spirit. All over the country there are now estancias belonging to married Englishmen who had none of the rough pioneering work. The estanciero looks after the peons, and helps them to get their sons out into the world; his *señora* is their doctor in illness, and looks after the women and children. At some of the larger estancias schools have already been started; and such a movement is certain to extend itself.

Whether politics will ever get honest; whether judges will ever consistently administer justice to poor and rich alike; whether country doctors will usually be considerate and kind; whether priests will, as a rule, lead blameless lives and look after souls—I can't say. But for the hardy, uncomplaining, and long-neglected gaucho class I am thankful to be able to feel that there is a better future in store.

Let us now turn to the agricultural population. This is composed, we may say with sufficient accuracy, mainly [1] of North Italian immigrants, called *Italianos* in the Argentine. South Italians (called *Napolitanos*) appear to keep to the towns and to do odd jobs; they are not such steady workers. These Italian colonists form a population by themselves; so far, they never intermarry with the natives. Habits, ideas, food, ways of life—all are different in the two races.

The industry of these colonists is wonderful; man, woman, and child, all work; and, though they are obliged to ride and to deal with cattle to some

[1] See note at end of this Chapter, No. (ii.).

extent, they seem to take to agricultural work as naturally as the Spanish-American did to hunting and stock work. You would hire Italian colonists (if they had time to spare) for ploughing or haymaking, but not for work involving lazoing or the handling of horses or cattle in matters unconnected with ploughing. They never seem to ride for pleasure; but I have seen the mother of a family managing five none-too-well-trained bullocks yoked to a plough, and quite little children will ride off bareback to bring cattle or horses in. Those who came, as some still come, to the country nearly destitute would take land on "halves"—that is, the owner would supply them with everything, and would take half the produce. With such my brother had to do at first, and very troublesome people he found them. But for many years he has had plenty to pick from, and he takes none but those who have some capital. These "find themselves" in everything, and pay a quarter of the produce as rent; friction is thus avoided.

He has found that the soil at Santa Isabel—very good soil—has a tendency to revert to the coarse native grasses unless it be worked for crops for four years. Hence he lets the land out to the colonists for this period, and sows alfalfa with their last crop. In some camps (those, I think, of rather sandier soil) it now answers to the estanciero to plough the land and to sow alfalfa at once, himself; and in the sandy province of San Luis, which as yet has not attracted colonists, this course must be pursued.

At Santa Isabel I observed that the alfalfa near the house, which had been regularly cut for hay, was nearly as good as ever after twenty years; but some of the paddocks that had never been cut, and were but thinly stocked, had begun to revert after but five years, and were to be handed over to the colonists for a second time.

The colonists on this estate take from four hundred to eight hundred acres of land, receiving it in August.

Let us try to picture to ourselves how such a family is then situated and what work lies before it. August, which, of course, corresponds to our February, is in general a month of bad weather; cold rain, even sleet, frosts at night, all may be expected. And these colonists, arriving, will find nothing ready for them. There is the bare plain of tussocky grass; some kind of hut has to be built, a well has to be dug, fences to be set up, and the land to be ploughed. In fact, at Santa Isabel there is a condition that 80 per cent. of the good land be ploughed up during the first year, and that each subsequent year this proportion of it must be kept under crops.

The first year it is too late to attempt any crop but maize, which is harvested as late as March or April. The next ploughing comes about April, and the sowing later. At Santa Isabel the crops for the remainder of the time are mainly linseed and wheat; but I understood that there are districts where maize is the main crop all the time. The linseed is grown for the seed only, the stalks being wasted or used as

TYPICAL NORTH ITALIAN COLONIST FAMILY.

THRESHING MAIZE AT A COLONIST'S.

To face p. 74.

litter. [To some extent we used linseed straw when burning locusts.] Beyond the fact that maize was usually the first crop, I did not observe any law of rotation of crops; I suppose that when land is so rich, and is used for four years only, you need not trouble about such matters.

Labour is scarce and dear; and therefore the colonist and his sons (or partners) plough and sow the land in successive pieces, and so are able to harvest it in successive pieces also. In Argentina the summer is of generous length, and there is little danger of running short of harvest-weather.

There are sometimes other ways in which the colonists can exchange their one great asset—viz., patient labour—for money or its equivalent. I found that where part of the land was too poor for crops of alfalfa—it was the *tierra blanca* that lay in the hollows—my brother paid the colonists about 17s. 6d. per $4\frac{1}{5}$ acres (or $10 per "square") to plough and harrow the soil and to sow it with rye-grass seed, which he supplied. Thus, instead of letting this land lie idle, he got a valuable winter-pasture that came in most usefully when the alfalfa was withered and brown; so that he was not obliged to sell off his stock on the approach of winter if prices were low. And the colonist could thus turn idle days to profit. Again, it is necessary—having regard to the devastation due to the locusts, as also to the problem of winter feeding—to understock the paddocks. Sometimes, therefore, the alfalfa will altogether "run away from"

the cattle; and it answers both to the estanciero and the colonists if the latter make alfalfa-hay on halves. Here, again, they exchange their work for the equivalent of money.

I took down some figures in the case of two of the colonists on Santa Isabel, so that a more definite idea might be acquired of the scale of things. But the areas were given me in "squares," and no one could tell me whether these were "new" or "old" squares; that is, whether the squares in question were nearer 4 acres or $4\frac{1}{5}$ acres. The metric system had not yet, in practice, mastered and abolished older measures of length and area. I have taken the $4\frac{1}{5}$ acres as the more probable. I will call the two colonist families A and B respectively.

Colonist.	Land held.	Amount under Linseed.	Amount under Wheat.	Linseed harvested.	Wheat harvested.
A	150 squares (about 630 acres)	42 squares (about 176 acres)	90 squares (about 376 acres)	90,825 kilos; or about 200,000 lbs.	200,508 kilos; or about 441,000 lbs.
B	200 squares (about 840 acres)	58 squares (about 244 acres)	90 squares (about 378 acres)	123,680 kilos; or about 272,000 lbs.	147,990 kilos; or about 326,000 lbs.

As regards prices, exact information may be derived from those quoted in farming periodicals each year. But what the colonists get is a different matter, and

depends partly on their distance from the market. I may, however, mention that for grain delivered to the purchaser on the estancia itself in 1909, the prices were—

For wheat, $8.15 (or 14s. 3d.) per 100 kilos (or 220 lbs.).
For linseed, $9.35 (or 16s. 5d.) per 100 kilos (or 220 lbs.).

Thanks (!) to the locusts there was no maize to sell; but the price, for delivery on the estancia, would have been about $4.40 (or 7s. 8½d.) per 100 kilos, or 220 lbs. And the colonists would have received about the same at their homesteads, free of taxes and freightage. It is evident, therefore, that there is a good deal of money to be made by a colonist of such holdings as the above.

As regards their expenses. Much is done by their own labour; the building of adobe huts roofed with corrugated iron, the digging of a well, the setting up of fences, all involve some expenditure in material, it is true; but the labour of all this, as also that of ploughing and sowing, is saved by this industrious race. They have to buy meat at the estancia when they want it, and other supplies, such as flour for bread, or biscuit (unleavened cakes) ready-made. Yerba, too, if they drink it; but this is cheap. It seemed to me that they spent a quite appreciable amount in cordials and wine; we were always offered these strong drinks instead of the Argentine national drink of yerba—(called *maté*, usually, because drunk out of the maté gourds). There is a direct tax of $10 (or 17s. 6d.)

a year for any carriage; but farm-carts are not taxed. For threshing the expense may be as much as 1s. 5d. per 100 kilos for wheat, and 2s. 1d. per 100 kilos for linseed; and I have given above some idea of the prices that he may receive for these grains on the spot when threshed.

If we reckon things up at the prices quoted, and deduct only the threshing expenses, we find that—

Colonist A received on the spot about £1,300 net for his wheat, and £650 net for his linseed, or £1,950 in all, in the year. Out of this he had to pay one-quarter for rent, and also his living expenses and wages to labourers (employed probably at harvest-time only).

Colonist B received £960 net for his wheat and £885 net for his linseed, or £1,945 in all, in the year.

Thus, these Italian peasants, living though they do in a very rough and uncomfortable way, appear to handle and to make a good deal of money.

In harvest they will probably, as already implied, find it necessary to hire some labour, lest the loss in the crop when cut prove great. And since they must, as a rule, attract men away from more permanent posts, they may have to pay them from 10s. to 12s. a day as well as feed them.

It must be a curious life that these men lead. They have no real homes, but merely uncomfortable adobe and mud hovels in which they live for some four years; and they don't know where they are

going next. Yet there is plenty of money to be made, there is abundance of food, and they are their own masters. They have their fortunes in their own hands to a degree that would not be possible to men of their class in Italy; and they appear to like the life and the climate. I observed, indeed, a remarkable (and deplorable?) absence of home-sickness among them.

The pick of the men that I saw will be moving on to another part of the same estate for four more years, so these will still feel at home.

There are estates—I believe mainly those of native estancieros—that are let out permanently to colonists. Whether, on these, the same men stay on the same holding for a relatively long time, I cannot say; but, as far as I saw, the dwellings were everywhere of the same uncomfortable kind. Beside the big stock-owners (estancieros) with their native peons, and the Italian colonists, there are also in the country small farmers, of various races, called chaquereros (spelling?), who own their land and often have proper brick houses. I saw such on the outskirts of the post-town of Melincué and of other camp towns. But these, as yet, do not form a relatively important class;[1] and therefore, when speaking of the agriculture in Argentina, I have spoken only of the colonists who are spreading like a fertilising Nile-flood over the country.

That, then, was how things stood at Santa Isabel;

[1] See note at end of this Chapter, No. (iii.).

and this was a typical estancia, though not the only type. The estanciero worked the stock with his staff of natives—of the old gaucho class ;—while the Italians, a race apart, drew their profit out of the soil in maize, wheat, and linseed, paying their rent in kind, and, when they moved on, left the land transformed and fit for sheep or cattle of the best breeds.

Before closing this chapter, let me give one word of warning.

Argentina is not (yet, at any rate) a country suitable to the English emigrant of the usual "emigrant class" ! With respect to this statement, I will simply say, "Ask any Anglo-Argentine." No English Emigration Society should send its clients, the overflow of crowded England, there. The Italian peasantry can emigrate there in masses, and will do well ; but for Englishmen it is a country for individual enterprise, not for wholesale peasant-emigration.

Note.—I have, unintentionally, generalised a good deal in this chapter. So I will add a few words in order to make my position clear. [See p. 6, lines 9–13.]

The statements—

(i.) that estancieros are in general stock-raisers (p. 66) ;

(ii.) that Italians form the main body of agricultural tenant-colonists (p. 72) ;

(iii.) that small proprietors do not as yet play an important part in the development of Argentina (p. 79) ;

are founded on my personal experience and on impressions received from letters and from conversations.

I have not looked up the statistics of these matters ; but I do not think that I am far wrong.

CHAPTER V

THE STAFF, AND THE WORK, ON AN ESTANCIA

LEAVING the colonists, who carried on their agricultural work independently, alone, I will now attempt to give some idea of the activities on the 40 square miles that was devoted to stock-raising. In these will be included such making of alfalfa-hay or silo as was needed for supplementary food for the stock in winter.

My brother's mayor-domo was a young Englishman born and brought up in the Republic of Uruguay, working later in Argentina. Hence I can take as of much more than local application a programme of the year's work that he made out for me.

And here it is, beginning with the month of March (autumn).

A Programme of the Year's Work.

March. Dipping flocks for scab.

April. Calving ends. At some places marking and dehorning calves begins toward the end of this month.

May. Marking calves and foals, and dehorning the former. Classification of breeding cows.

Counting and stock-taking may be done now.

June. Weaning of calves. Sowing alfalfa. Dipping sheep (for scab) before lambing.

July. Calving begins; also lambing towards the end of the month. [In some few places they have lambing in April.] Sowing alfalfa may be going on this month.

August. Calving and lambing continue.

September. Calving continues. Lambs are marked.

October. Calving continues. Shearing takes place. Perhaps haymaking begins.

November. Calving continues. Dipping flocks for scab. Haymaking.

December. Calving and haymaking continue. Curing for maggot.

January. Haymaking. Towards the end of the month weaning of lambs. Curing for maggot continues.

February. Haymaking may continue. Curing for maggot continues. Classification of flocks.

Odds and Ends of Work.

Beside the above work there are "extras" that may or may not have to be done. I will mention a few of these.

Vaccinating cattle for anthrax or for mancha ("blackleg"). I saw this going on at Santa Isabel in May, 1909. Other vaccinations, as of sheep or of calves, are occasionally needed. When the

locusts come [and there seems no reason why they should not come every year], some work of destruction has to be done, in order to satisfy the Commissioners. I hardly think it too much to say that in 1908–9, from October 25th to the end of February, the whole of the staff *might* have been (vainly!) employed in destroying locusts that came to lay, ploughing up and destroying eggs, burning young locusts, and destroying in various ways the growing and grown locusts! So, practically, estancieros do a little when they can spare the men for the work, mainly to avoid getting fined.

Handling colts and getting them tame enough to be taken to market as "unbroken"; perhaps breaking in riding-horses; making terraplanes (raised ways of beaten earth) across miry places; repairing fences; seeing to windmills; hunting up dead animals and securing their skins; and many other odd jobs.

The Staff on the Estancia.

And now, what was the staff with which all this work was done? The amount of stock to be dealt with has already been given (see p. 52). First there was my brother, head of all. Then, under him, came the young English mayor-domo. These mayor-domos are understudies of the estanciero. They work for very little pay; but, if good and capable, their next move *may* be to a managership "on shares" worth one or two or more thousand a year,

and they may end by being wealthy men. I should say that, as a rule, the climax of their training (which may give them virtually a diploma of fitness for a managership) comes when they take charge of the estancia while the estanciero or manager is away for six months or a year. I doubt whether any capable mayor-domo would ever return to the subordinate post after that.

Of the house-staff (including the carpenter-blacksmith) I will say nothing.

Next in authority to the mayor-domo came the capataz, of whom I have spoken already on p. 70. He was, of course, a native; he was a married man with house and food free and £7 a month; and one of his sons got £2 12s. a month as puestero.

The capataz was the general head of all the peons and was under the orders of the owner (or manager) and mayor-domo only; his opinion was often asked, and had weight. He had certain peons assigned to him of whom he disposed. The other peons would get their orders from headquarters direct; but, if working in company with the capataz, they were under him as a matter of course.

I found also a so-called "sheep-capataz," whose special duty was to look after the flocks; and he directed any other peons who might be, from time to time, told off for work with sheep. He got a puesto (married quarters) and food free, and £4 7s. 4d. per month. He was not under *the* capataz, but was not nearly so important a man.

Then came some eight puesteros (not including the capataz's son and the sheep-capataz). These had married quarters and food free, and received £2 12s. per month. A puestero might have an outer gate of the property to look after; one or two paddocks of 1,600 acres each to ride round, looking out for and reporting dead or sick animals; and a windmill or two to inspect daily, reporting if anything were amiss. He might also have a noria or jagüel to draw water from; but usually he would turn this duty over to one of his children.

Of other peons paid by the month (or mensuales) there were—first, the married pair, of whom the wife cooked for the peons and the husband looked after the smaller home paddocks; and they got £4 7s. 4d. per month between them. There were three men directly under the capataz, getting £3 10s. per month each. Also a man at £4 7s. 4d. per month to keep the fences in repair. And finally, a man and boy at £2 12s. and £1 15s. per month respectively to look after and draw water at some wells that did not come under the charge of any puestero.

Peons at daily wages might be hired on special occasions. But of such there were some dozen who were practically as permanent as the monthly men. These got bachelors' quarters and food and about 2s. 7d. per day for ordinary work; but if one was doing cattle work on his own horses, he might get as much as 4s. 4d. per day.

Thus there were on the estancia about twenty-

eight natives, of whom probably any could be turned on for stock work; though it could by no means be assumed that all could lazo *well*. The men, however, actually available for any odd job (such as killing locusts) would be very few, since most had their day's work cut out for them already.

I will now return to the calendar, and will describe what I saw, beginning, however, with October.

Making Hay and Alfalfa.

I have already (pp. 75, 76) alluded to the making of alfalfa-hay and to the sowing of rye-grass. But I will now speak more definitely about this matter. Alfalfa is a splendid pasture; but it has one weak point: it withers away and becomes brown in winter, affording then but little nourishment for the stock. Fortunately, however, it grows up so luxuriantly after rain through a great portion of the year that it can usually be cut several times for hay; and alfalfa-hay is very good food.

How much of such hay an estanciero must make depends on several things; on whether he has sown much rye-grass and other grasses which are green in winter; on whether he has arranged with colonists to make it for him "on halves"; on whether he means to sell off much of his stock before the winter; and on whether the locusts that year are so bad that he must use up some of his hay in the summer before the locusts go and the alfalfa recovers

itself. Hence I cannot be very definite as to the amount of haymaking that went on as a regular part of the year's work.

Nothing in particular was going on when I arrived; but in October there was cutting of alfalfa and cebadilla for hay and silo. [This cebadilla *ought* to mean "barley-grass"; but it doesn't! It means a native oat-grass whose seeds are black (they can be threshed out). Proper oats, such as we make porridge of, are called avena.] Of the cutting with machines there is nothing to record; nor can one say anything that is new of the hay-stacks, save that, in the present wasteful Argentine way (for there is land in abundance, but labour is relatively scarce) the stacks were never thatched.

But the silo was more interesting. To dig a pit for the green herbage as in England would have required too much labour; as would also the subsequent hoisting out of the silo when the cattle were to be fed. So the silo was made in a stack.

The rough rule appeared to be to put on about 1½ metres depth of the green stuff, and then to wait until the temperature half-way down this had (through fermentation) risen to 50° C. (122° Fahr.). Then another layer was put on.

When the stack got too high for hand-lifting, the crane (cigüeña) was used. Of course this was worked by a man on horseback; most things were at Santa Isabel! The horseman rode away, the rope being fastened to the lazo-ring on his saddle, and the load

rose in the air. He then circuited round, and the load came over the stack. He rode in again, and the load descended on the stack. [I may, however, say here that, though Santa Isabel stands in the very front rank of estancias as far as stock goes, as has been shown over and over again by the prizes won, my brother has a particular liking for old methods where no harm is done by using them. There *are* more modern stacking machines in Argentina!] When the cutting of about 38 acres was on the stack, earth was hoisted on to the top and was built up into ridge form. This earth was not thatched, but weeds soon grew on it.

When finished, the stack that I saw made was 23 feet long and 16½ feet broad. Its height I did not measure until it had been settling under its own weight and that of the roof for two days; but it was then 8 feet 3 inches high. Two months later it had sunk to 6 feet 6 inches. There had to be a trench made round it to take the liquid that was pressed out; and the smell of the whole was horrible. [My brother, however, liked it; the knowledge of the silo's nourishing properties biased his judgment in this case.] A rough calculation gave us that the 38 acres of cutting yielded finally some 70 cubic metres of silo, or about 63 tons weight of it.

Sheep-shearing.

The next business that came under my observation was the sheep-shearing.

There were 6,520 sheep and 3,700 lambs to be shorn; and, of course, the regular staff of peons did not suffice—very few of these indeed could be spared.

So my brother wrote to a man (he looked like a one-eyed murderer when he came) who he knew could collect some shearers; others he got in other ways. Finally, there were collected an alarming-looking mob of ruffians (I never saw such a lot!) —35 men to shear, and 13 more to tie the sheep and to help in other ways; two women came with them to cook. Some of the regular estancia staff brought up the sheep at intervals to the pens into which the doors of the galpon opened. The shearing was done inside.

The order of the day was as follows: They began work as soon as the sheep were dry enough; dew did not take long to dry off, but rain might make the work very late in beginning. At 8 a.m. (if at work already) they had half an hour for first breakfast, consisting properly of yerba (Paraguay tea) and biscuit. There seemed, however, to be meat "going" also.

Then they went on shearing in the galpon. The tyers got sheep from the pens, tied their legs, and brought them to the shearers inside. At a table the wool was received and tied up; and here the sheep-capataz attended with a bag of latas or brass tokens, giving one to each man for each sheep shorn. Later on each lata was cashed for $1\frac{1}{20}$d., the pay, therefore, for shearing a sheep.

The shearing and tying I could not photograph in the galpon, the light being too bad; so I got some of the men to come to the door.

In the illustration the tyer is wearing a most un-gaucho-like sweater, a modern innovation; but the handle of the traditional Argentine knife can be seen. I took also photographs of shearers at work.

The receiving table had to be photographed inside the building; and, in the five seconds of exposure needed, the sheep-capataz (who is seen to be carrying the bag of latas) slowly moved the upper part of his body.

At 11.30 they knocked off work for an hour for the real breakfast, the "déjeuner à la fourchette," and at this I think they had yerba and biscuit in addition to the regulation rice and meat.

At 3.30 again there was half an hour for maté and biscuit; and when, at sunset, the day's work came to an end, they again had maté and meat and rice.

Where and how they slept, Heaven only knows! The native saddle consists of various rugs and sheep-skins, &c.; and these men are still gaucho enough to sleep anywhere, so long as they have their saddles with them—as all had. Many a time used my brother in old days to go hunting "down south" for a few weeks; and he slept on the open prairie, using his saddle and a poncho as bed. Work was suspended on Sundays; and, as is usually the case where men of the gaucho class are collected together, there were races. In all such peons' races the riders

TYING SHEEP FOR SHEARING.

THE RECEIVING-TABLE.

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(as far as I could learn) race bare-back or on a cloth only.

Beside the races, gambling for latas (usually the gambling is done with the throwing of a knuckle-bone, unless this too is becoming out of date) went on continually; so that one man might bring up at the end 1,000 or 2,000 latas (worth some £4 7s. 6d. or £8 15s. respectively), and another have none at all to bring.

I should say that the shearing was very rough in quality, and not at all remarkable for quantity; these shearers are "nowhere" as compared with New Zealanders or Australians. One New Zealander who turned up astonished them much; the more, as he had his sheep left untied. [That was another year, not this time.] The best day's work for the 35 shearers was about 1,150 *sheep;* and the 6,520 sheep and 3,700 lambs took them eight or nine days.

The total weight of wool was 29,190 kilos or 64,220 lbs. It lay for some time, packed in bales by hand, in the loft of the great galpon. Then a contract was made with a man to bring carts and to take it to the station at Melincué.

So he came with seven huge four-wheeled carts, each drawn by about ten horses. There were ten cartloads, a load being therefore about 3,000 kilos or 6,600 lbs.

Prices vary with the year and the season, as also with the quality of the wool; but $7\frac{7}{10}$ d. per lb. gives some idea of the price received.

Scab and Dipping.

Scab seems a great curse in the country. The sheep keep re-catching it, especially from the wire fences on which other scabby sheep have rubbed themselves.

My brother's young mayor-domo (see p. 81) told me that at his father's estancia in Uruguay they had some years ago completely eradicated scab by eighteen months' treatment. But they took the trouble to keep their sheep from rubbing against the boundary fence, which was probably infected by scabby sheep on the other side, by putting up lower wires a yard from this fence. At Santa Isabel things were not as yet so carefully done; for example, I noticed that scabby wool was not completely removed from the fences.

Some fourteen days after the shearing all the sheep were "dipped" for scab. The theory is that the first dipping kills the mature parasites but not the eggs; and a second dipping is given some two weeks later. The double dipping was repeated perhaps even five or six times in the year at intervals of about two months.

Lazoing Calves for branding and dehorning, and Colts and young Mules for branding.

I will now pass on to the lazoing of calves for marking and dehorning, though this took place much later (in April or May, 1909).

Calves were marked when from two to seven

CARTING AWAY THE WOOL.

DIPPING SHEEP FOR SCAB.

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months old. At Santa Isabel the dehorning was performed at the same time; and the process was (I heard) so brutal that I could not have borne to see it. This same young mayor-domo told me that "at home" (*i.e.*, at his father's estancia in Uruguay) they did the dehorning quite successfully at a much earlier age, when the calves were (I think) only three weeks old; it was not nearly so brutal then, but required more skill and knowledge. But they could not be branded so young; the mark would not have lasted as the animal grew.

As far as I know, the only practical use of dehorning is that the dehorned animals are less likely to injure each other when carried by rail in trucks; though I fear that mere appearance has a good deal to do with this painful maiming being inflicted on the poor beasts.

For both marking and dehorning the calf has first to be lazo'd, and then to be thrown. For this last, there have to be men on foot who lazo the legs of the animal after the horseman has lazo'd it by the neck.

The lazo is of green hide, plaited or twisted, and is about eighteen yards long. At one end it is fastened to a ring fixed on the saddle; and at the other end there is a ring to give the necessary slip-knot. In use, there is made at the free end a large noose of some six feet diameter. The free part is laid against this for some three feet; and the cord of the noose, the free cord, and usually the cords of one or two small coils, are held in the right hand. The left hand

holds the reins, the rebenque (a sort of thong-whip), and another small coil or two of the lazo.

The big noose is whirled round the head, its weight, and that of the iron ring (which is some three feet from the hand), giving it "go" enough in spite of the very considerable air-resistance. [See frontispiece.] When it is discharged the few coils held in the left hand are also in the end let go, and the lazo is finally left attached to the ring on the saddle only. The animal is made to pull the noose tight, the horseman merely hanging back or to one side.

In 1888, when there was much lazoing of full-grown "native" animals done at Santa Isabel, I remember that I was very much disappointed with what I saw; one reads such wonderful accounts of what gauchos do! I believe that there *are* very striking exhibitions given by picked cowboys of Anglo-Saxon race from North America, who perform for pay; but that is another matter from the regular run of Argentine lazoing.

Here the animal was pursued at a very short distance, and the lazo flung when there was but little relative motion. The object was—(I am still speaking of 1888, when "native" cattle were being lazo'd, and dehorning was unknown at Santa Isabel; for in 1909, when the calves were to be dehorned, they were intentionally lazo'd by the neck)—to get the noose over the horns; and I remember well how often the neck was caught instead, and how complete

THE LAZO FALLING ON A CALF.

DRAGGING A LAZO'D CALF.

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misses were by no means rare. All the catching by the feet that I saw in both my long visits of 1888 and 1908 respectively, was done by men on foot after the animal had been lazo'd, and when it was plunging about more or less in one place.

[This tripping up by lazoing the legs is called by Anglo-Argentines "pielaring," the native verb being *pielar*.]

The fact is, I suspect, that the lazo is a somewhat clumsy and a very difficult instrument to use. These men had been at it all their lives and were very good horsemen, and if they could not astonish one by their performances, it may be rather a point against the lazo than against the men.

In the lazoing of the cattle-kind that I saw and photographed during this second visit (1908–9), the animals were, as already said, only calves, and the work was not nearly so exciting to watch as it was in 1888.

Indeed, the whole thing was more interesting then. The camp was not yet cut up into a number of paddocks, and the corrals were few and small; so most of the work was done in the open, and larger mobs of cattle were dealt with. The various lots of cattle were trained, in a rough kind of way, to collect round one or another of several posts stuck up in the camp whenever men on horseback came about them shouting "Buuuuu . . . ey!" *buey* being one word for "ox"; and such a mass was called a rodeo. Then a number of the men (I used to be one) kept

riding round the restless group, numbering perhaps 1,000, or even more, to keep it together. Had separating to be done, some tame draught-oxen were stationed at some little distance as a decoy, and then some of the men rode into the rodeo and picked and drove out their animals, chasing them across to the decoy-oxen. Work it was often to prevent the whole lot from following them! We, on guard, had to pay heed to nip in the bud any tendency for an outward-tending wedge to form on the edge of the rodeo. Sometimes it happened that a calf would think that its mother had been driven out, and would make away from the rodeo, eluding the sentinels with the curious stupid-seeming, but really cunning, agility peculiar to calves and lambs. Then the real mother would follow; another calf, this also under a mistaken idea that its own mother was going away, would follow the cow, and so on. Soon a point, then a wedge would be formed; and vain would be all the frantic riding and throat-splitting shouts of us horsemen! The rodeo had broken up; all work was over for the day, and the work so far accomplished was undone.

But all this was in 1909 a thing of the past. The work was now (counting stock and some sorting excepted) mostly done in corrals; and, anyhow, the breaking up of the camp into paddocks had made the numbers to be dealt with, at one and the same time, much smaller. Further, the cattle were now much tamer; they were Durham (mostly) and not "native."

PIELAR-ING A LAZO'D CALF.

PIELAR-ING A YOUNG MULE (ALREADY LAZO'D).

To face p. 96.

Returning to the lazoing witnessed in this last visit of 1908–9, I will here say a word about the illustrations.

In the frontispiece we see the lazo being whirled, and it will be noticed that the lazoer holds but *one* small coil in his right hand (see frontispiece). The fact is, the manner of holding the lazo varies somewhat. In the figure showing the lazo falling on a calf, the horse's head is thrown right back against the rider's chest, and the arm runs past the animal's eye. In that showing the pielaring of a calf, the lazo running from the animal's neck to the saddle of the horseman (who does not come into the figure) is hardly visible. The distant white line represents a group of the estancia gulls settled in a field. The young mule (or is it in this case a colt?) has also been lazo'd already; but here, too, the lazo running from its neck is not very visible.

The lazoing of colts and of young mules for branding was much more exciting. The pace in pursuit was great, and, as the animals might easily be injured, the capataz himself did all the lazoing. Owing to the pace much dust was raised, and so it was almost impossible to get good photos until the animals were actually lazo'd and the pielaring began. Of course, mules and colts rear, while calves do not, and the former came terrible croppers! I have secured some photos that make very striking lantern slides—one of the capataz lazoing in a cloud of dust; one of the "side-pull" from the saddle which

a lazoer gives, by turning his horse sideways, when he wishes to hold a captured animal; one of a rearing mule, and one of a mule in the act of toppling over backward after rearing.

The smoke from the branding suggested pain, but the animals showed no signs of it. Indeed, I do not think that it would "answer" to make a real burn, a sore, as the flies would then give trouble.

Counting the Stock.

The counting of the stock was interesting. My brother and the capataz, each provided with a sort of rosary of beads, went with attendant peons to one paddock after another to count the cattle, some 500 or 600 at a time, while the sheep capataz with his men counted the sheep in the pens.

The cattle were rounded up, and then the peons made them pass in a thin line between the two counters. The beads served to record the tens or hundreds. A significant detail was that when I photographed the process I had to stand so as to be concealed by the horses of the break. The cattle are used to horsemen, but the sight of a man on foot would have made the animals unmanageable. So also native cattle may horn, and other cattle will mob, a man on foot. I had some uncomfortable experiences of this.

"Palenquearing" Horses.

Another of the regular operations that I witnessed was the treatment that was given to untamed horses

of 2½ years old[1] in order to make them tame enough to be exhibited at the Rosario sale as "unbroken"—*i.e.*, tame enough to be driven in mobs or to be tied up. It was not the real breaking-in of horses; this last is done usually at 3 or 3½ years old. The horses were driven into the corral first, and then a headstall (*very* strong!) had to be got on. In former days they would have been lazo'd and thrown, but now the less risky process of driving them into a manga was adopted.

Each horse in turn was tied up to a palenque (which is either a tying post or two posts with a cross-bar) by means of a strong hide thong attached to the headstall, and there it seemed to go mad with panic and rage (?). The legs were tied together and untied again, the horse was patted and handled, and later on was flapped with a sack. The object was, of course, to show the animals, first, that resistance was useless and produced discomfort, and second, that no harm came of it all if they did not struggle. The panic of the horses made the process look brutal, but no unnecessary force was employed. The roughness of the whole thing was due to the fact that the animals had grown up for the two and a half years unaccustomed to mankind. The palenque gives the name to this handling. [See illustration facing p. 102.]

Vaccinating Cattle.

Perhaps the vaccinating of cattle for anthrax or else for "mancha" (blackleg) may be included in

[1] Of course they might have been younger; say 1½ years.

the regular work of the estancia, as it is so often performed. The cattle are introduced, so many at a time, into the "manga" (a narrow, boarded-in gangway with sliding doors, as already explained), and the vaccinators, leaning over from outside, vaccinate them behind the right shoulder. When I witnessed (and photographed) this operation it was performed with the lymph intended to protect the cattle against mancha, and my brother and the mayor-domo did it all themselves. One man can vaccinate one hundred and fifty in an hour.

Sowing Alfalfa for Pasture.

The last regular work that I shall mention is the sowing of alfalfa as I saw it. At Santa Isabel, as already explained, there was no direct ploughing by the estanciero, but he sent his peons to sow alfalfa behind the colonists when these were sowing their last crop. I noticed that the colonists were sowing their wheat at a trot. My brother's alfalfa machines followed more slowly, and by making several trials he endeavoured to regulate the flow of seed to about 25 kilos per square, or 55 lbs. per $4\frac{1}{5}$ acres. [Here, again, there was doubt as to the exact value of the "square" in acres.]

CHAPTER VI

MISCELLANEOUS MATTERS CONNECTED WITH LIFE IN THE CAMP

Horsebreaking.

THE breaking-in of riding-horses was not, at Santa Isabel, part of the regular work. My brother sold his colts unbroken, and usually bought his riding-horses broken.

On another estancia, however, I witnessed some breaking in, the subjects being in this case mares of big make, 3½ years old, that had never been touched before. In the "camp," at any rate, only geldings are used for riding; and I believe that in the present case the breaking-in by riding was only a way of getting the mares tame. It was somewhat unfortunate that it took place in June (full winter), and in dull weather; for the light was then quite below the mark for quick photography.

I had first better give some description of the Argentine saddle, or recado. This is gradually built up; and hence saddling an unbroken animal is no easy matter.

First come some skins or cloths. Then two long

bolsters (called bastos), made of a stiff cane-like reed covered with leather, that lie on either side of the spine. [I seem to remember that, during my visit of 1888, I saw some bastos made of wood.] These are connected over the back and secured by a cinch under the belly ; and this is *the* cinch, *par excellence*.

Next come several skins. The last but one of these is a soft and woolly sheepskin that is always very conspicuous at the back and front, through the wool bulging up ; while the last of all is a shorter skin, soft and smooth but not slippery, comfortable and cool to sit on. A thin cinch round all keeps these later skins in place ; but the first cinch mentioned is that which holds the saddle on. Thus the Argentine saddle gives a soft and flat seat, and is not peaked before or behind ; it is a great contrast to the Chilian saddle.

The stirrups again are very unlike the Chilian stirrups. They are flat discs of wood, often much ornamented with leather and metal, with a hole for the toe. This can be seen in the illustration facing p. 62. Thus the foot cannot catch in them when a rider is thrown. A rider can hold on tighter by turning the stirrups inward towards the girth ; and, if he expects bucking, he will often tie his lazo (or his boleadoras) across the saddle in the front, so that he can get his knees under it. The usual bit is a curb of some sort, used with a single rein ; and steering is done by pressure on the neck. There is no "throat-lash" ; and so the whole comes away easily. Therefore, if the horse is to be tied up, the headstall (bozal)

PALENQUEAR-ING HORSES ($2\frac{1}{2}$ YEARS).

BEGINNING TO BREAK IN A $3\frac{1}{2}$ YEARS MARE.

To face p. 102.

and leather thong attached to the headstall (cabresto) must be kept on also. The reins are separate; and therefore, if a man be thrown (no unlikely matter in plains where there are so many armadillo and other holes) the reins and cabresto trail; and the horse is not much inclined to run away, lest he should tread on one of the three thongs and hurt his mouth. When a horse is being broken in, a bit is not used; for it is substituted a thong of green hide that grips the lower jaw tightly behind the teeth. This is called a bocado.

The tamers, or domadores, that I saw were quite young men—they have need to be!—and wore the chiripá and drawers and very handsome tiradores. But they had on short jackets and caps; there was nothing of the old, draped gaucho looseness of dress about them.

[By the way, it is curious how natives muffle up their throats in nearly all weathers! They seem to consider this to be as important as is a cummerbund in some climates. This domador had taken care to have a very gay handkerchief round his throat.]

There was no manga at this estancia; and so the mares had to be lazo'd, thrown, and secured, before the headstall could be put on. This was risky work; —the animals might well have been injured, since they go wild with panic. When the first stage was over, the animal was standing tied to a post by a very strong thong.

Some restraint was needed during saddling; so a thong was thrown over the back, cleverly caught as it

swung under the belly, and then made into a slip-knot that was shaken back until it fell over the tail and gripped the animal lightly above the hocks. There was also some further restraint.

To describe in detail the saddling, and the getting the bocado in, would be tedious. But it can be imagined what patience was required. Often, when the first skins were on and the bastos in place but not yet secured, the animal would throw herself down and hang gasping from the post.

Not only did this scatter the skins and bastos, but the tying-up thong had to be lengthened out, the mare kicked (with rope-soled slippers) to her feet again, and then the thong shortened up and the saddling recommenced.

A characteristic detail, I was told, was the domador's use of his teeth as a third hand. One often hears the "splendid teeth of the peasantry" spoken of by people who have not attempted to verify the implied statement. But the gaucho class really *have* magnificent teeth; their meat diet gives the teeth plenty of hard work (one essential), and the diet and way of life between them are responsible for absence of indigestion and of acid in the saliva.

Well, the riding looked bumpy, decidedly! Twice I saw a domador thrown heavily.

I succeeded in getting several photos of the actual breaking in; and these have made very interesting lantern-slides. But, partly because I have had to cut down my six hundred photos to some ninety for

purposes of illustration, and partly because the poor light made them somewhat too defective in detail to make good pictures, none of these are given here save that of the struggling mare shown opposite p. 102.

There was another man, on a tame horse (called a padrino or sponsor), who accompanied the rider as far as was possible. One of his most useful functions was heading the panic-stricken animal away from fences and posts; the mare, of course, understanding jostling from one of her own race.

It was noticeable in all my photographs that the rider never had his feet under the animal's belly. On the other hand the lazo, tied across in the front, did seem to keep his knees down.

A Camp Auction.

One very important way in which an estanciero may make money consists in picking up stock cheap at sales, keeping it for a few months or a year on good alfalfa pasture to fatten it, and then reselling it at perhaps twice the price paid. And this leads me to speak of the camp auction. I went to see one; it is decidedly a feature of camp life.

An estanciero had died, and his property, by Argentine law, had to be divided equally between the children.[1] Such division naturally often leads to sales of stock. There are firms of auctioneers, or firms who employ them, that do very well in this business. They get, on stock, 4 per cent. on the money realised; and, as sales are on a very large

[1] I forget what share the widow has.

scale, they can afford to spend money in attracting purchasers. There is a good "breakfast" provided, with wine; there are drinks if you want them; and very often (I believe) special trains are run with free first-class tickets. I have seen such advertised. The auctioneer to whom I listened had the voice of a man of brass! His way (the usual way, I was told) of calling out the offers already made was curious. Were it, *e.g.*, 8½ dollars (*i.e.*, *ocho y medio*), he would cry, "*Ocho y me-me-me-me-me . . . medio*"; and this began to get on my nerves at last as a bad stammer might. Personal appeals, by name, were often made to my brother; and the whole thing was conducted with such untiring energy and undiminished noise that one wondered how any human throat could stand the wear and tear. In one feature the auction resembled those at home, viz., the imperceptible way in which bids were made. I—but I am not a business man—thought my brother had never responded to the auctioneer's appeals, but I learned at the end that he had bought a trifle of 1,000 sheep and 500 cattle or so —I am not sure of the numbers now.

Argentine Brick-making.

In the great alluvial plains of Argentina there is no clay to be found. Bricks have to be made with ordinary earth, and therefore—as in Egypt in old times—"straw" is needed to bind the mud together. I saw a piece of brick-making that was typical.

Some 100,000 bricks were needed for additions

to be made to the estancia. Now the bricks are made by causing mares (the maids-of-all-work in Argentina) to trample into a sort of clay earth, water, and straw; this is then moulded into proper shapes; these are sun-dried, becoming the well-known "adobe"; and finally these last are burned into true bricks in a kiln. So enclosures have to be made, called "pisaderos," in which the trampling is done; water has to be supplied; land has to be levelled on which the brick-forms may be dried; a simple mould for making the bricks is needed, and also some fuel to start the burning, the straw in the bricks themselves serving as the rest of the fuel. The bricks in question were to be 30 cm. (or $11\frac{4}{5}$ inches) long, 15 cm. ($5\frac{9}{10}$ inches) broad, and 6 cm. ($2\frac{2}{5}$ inches) deep.

My brother covenanted with a man to make them at the estancia for £1 2s. 4d. ($13) per thousand, there being special conditions respecting the percentage of soft bricks (or "bayos") to be allowed, and the price of these. [Liability to *softness* is a weak point in Argentine bricks.]

My brother supplied, of course, the land in its natural state, with a well handy; he lent fifteen mares (poor brutes!) for the trampling, and posts and wire for the pisaderos.

The contractor did all the rest. He came with five men and wife and family, rigged up his own shanty, supplied or bought his own food, collected refuse hay, &c., for the mixing, and also bones, old carcases, dung, &c., for fuel.

He made two pisaderos, each about 14 yards in diameter, and used them alternately; trenches connected these with the jagüel.

When the mixture in a pisadero was ready, two or three men made bricks from it separately. I do not think I need describe the method, but will only say that the moulds made two at a time, and that the bricks were at first laid out flat, and then (when hard enough) built into ridges to dry further into "adobe." It is to be noted that, in the adobe, the straw remains to give toughness to the dried mud, while it serves as internal fuel when real bricks are made.

It was characteristic of the plains of Argentina—where children play with bones, and men sit on skin-covered skulls, everything seeming to have to do with the animal kingdom—that when I found decomposed heads and ribs lying on the roads I knew that the carts of the *fuel*-collectors had passed that way!

[Oh! it was such a relief sometimes to get among the blooming lino or the wheat of the colonists; to get away from bleeding hides, decaying carcases, and still more from evidences of perhaps necessary but yet cruel treatment of animals, such as dehorning! This, by the way.]

The finished kiln was in the form of a truncated pyramid of base 42½ by 21¼ feet, sloping height 13 feet, and top 36 by 16½ feet. At the bottom, across the base, were eighteen passages each 1 foot 4 inches broad by 1 foot 6 inches high, to contain the fuel that was to start the burning. Otherwise

there were no spaces left designedly, only the unavoidable chinks, which were sufficient for the passage of the flames and hot gases. A change of wind, occurring after the kiln had been fired, threw out the calculations of the brick-makers, and the burning was not a good one—there was too large a percentage of soft bricks ("bayos"). Still, there were rather over the 100,000, and they sufficed for the building to be done.

Some Notes on Buildings in the Plains.

This is a chapter of odds and ends, and so I will put in here some notes on the buildings "in camp." The oldest buildings were, I suppose, the tents, or toldos, of the Indians. These were made of mares' hides and had a single ridge-pole. I saw none myself —Indians have gone—but my brother told me of them.

Next to these in simplicity would come turf huts (which can be made only on some soils), and mud huts, which are still made by quite well-to-do colonists as annexes to their adobe huts. One way of making these is to erect corner posts, to stretch horizontal wires between them, and then to double over the wires roly-polies of mud having wisps of long grass as cores. This forms a sort of mud screen that preserves its shape in virtue of the wires and the grass cores of the mud-rolls. Then both faces have more mud thickly plastered on them, this mud holding on to the surfaces on account of the unevennesses resulting from the construction described

above. If the whole be whitewashed we may get quite a nice-looking little cottage. Another sort is made more as concrete houses in England are made.

Of adobe huts there is no need to say more ; adobe is simply like bad and fragile brick. [See opp. p. 74.]

Turning to more ambitious buildings, the brick houses of the estancieros, we may notice that these have changed much in form. When Indians were about the estancia was more or less of a fort, and it always had a flat roof (an azotea) from which the inhabitants could get a good view over the plains. The illustration shows one photographed in 1869.

These times are not very distant, even in some of the districts now covered with fences and near railway stations. I think that some commissioners were killed by Indians near Melincué (my brother's post town, and one of his railway stations) only a very few years before he came to settle there in 1883. There had been an adobe fort and a brick watch-tower (mangrullo) at Melincué. The fort had been destroyed by rain, but the watch-tower was standing in 1909, and I photographed it then. I have, too, a sketch that I took in 1888 of a neighbouring estancia of singularly simple form. It was a mere two-storied tower with a flat roof, and also dated from "Indian" days. It was called the "Pedernal." Of more modern estancias I need not speak. They may have any form, but I should say that most are one-storied and have verandas. Nor need I describe further the very characteristic houses of the camp-towns, as I have

Photo] [*H. N. L.*

ESTANCIA IN "INDIAN" TIMES.
(From a photo taken in 1869.)

A RELIC OF "INDIAN" TIMES.
(Spy-tower still standing at Melincué, F.C.C.A., in 1909.)

already spoken of these on p. 47, and they are shown in the illustration facing p. 46.

Carts in Argentina.

In the vast stoneless plains of Argentina carts travel either over the open camp with its tussocky grass—land that is often swampy also—or along roads (so-called) that may be deep in dust or mud. Hence, I suppose, the huge wheels that have always been, and are still a feature of the camp cart. My brother in 1869 photographed a sort that was even then old-fashioned, being made entirely without iron; and I took a fresh photo from one of his faded prints, to preserve this interesting record of primitive Argentina. Next in antiquity, and still in use, though, I fear, obsolescent, comes the picturesque two-wheeled cart with an awning (or "toldo"), made in the ordinary way of wood and iron. The wheels are 10½ feet high, while the height of the cart from floor to roof is 8 feet 10 inches, and the width inside is 4 feet 7 inches.

The commonest cart for general purposes is a four-wheeled one that will carry three tons or more. Its hind wheels are also 10½ feet high, and the "length" of the cart (I am not sure how much this included) has been given me as 59 feet. [All these measurements were obtained for me by a friend from a native wheelwright in Melincué; but, of course, I had to change from metric to English measure.] This common sort of cart may be seen in the illustration facing p. 92.

One may have as many as twelve or thirteen horses of all sorts, sizes, and colours, employed to drag these huge ships of the Pampas. And as they appear to be tied on anywhere — many to the sides — it can be imagined how widely the teams spread out when pulling begins! Every native saddle has, or can have, an iron ring attached firmly on its side, to which (*e.g.*) the end of the lazo may be fastened. This ring is much used also for traction. Either a rope or thong is tied to it and to one side of the cart, the horse being then called a "ladero" (Spanish *lado* = side), or the pole of a cart or low truck is fastened to the ring direct. A boy on horseback pulled the hay-trucks in this way.

English "as she is spoke" in the Camp.

I doubt whether any other language so invades and injures the English language as does Spanish in the case of English residents in Argentina. And, seeing that in any case literature is held of small account in this land of practical aims, it seems a great pity that the Anglo-Argentines do not take more pains to preserve their own language pure.

Spanish is Spanish and English is English, but a good deal of what I heard was neither; and I would fain appeal to my fellow-countrymen out in Argentina to pay rather more attention to this matter, and not to allow our splendid language to become (out there) inferior to Spanish in richness. It seemed to me that English is being injured in three distinct ways.

Firstly, it is being mixed with Spanish words, used rightly but unnecessarily. I heard *lujo* used for luxury, *alivio* for relief, and *polvo de ladrillo* for brick-dust, and so on. Evidently many common English words may soon be forgotten by the rising generation of Argentine-born English.

Secondly, it is being mixed with Spanish words used barbarously. An Englishman resident in France does not say "I *aimer'd* her very much," "I *manger'd* a hasty lunch," or "I *blesser'd* my arm." But in Argentina the English residents use, in the case of verbs without number, such forms as "That pivot is *gastar'd*" (worn), where the Spanish verb is *gastar* (to wear or spend) and the past-participle is *gastado* (worn or spent); "he *golpear'd* his foot against a stone" (knocked it), or "they *revocar'd* the wall" (plastered it).

Thirdly, English words are getting to be used in a Spanish sense. I heard an English estanciero, a Public School man, say that he and his family could very well *occupy* six empty barrels. I thought of "Ali Baba and the Forty Thieves," but he only meant "make use of" (Spanish *ocupar*).

To *regulate* an account is to settle it (*arreglar*); to *despatch* a messenger is to give him his instructions—usually the day before he starts. The Spanish "j" is a rough aspirate, and *juntar* means to [join or] *collect*. Thus one can "juntar" maize. But surely it is very barbarous to speak of "hunting" maize instead of collecting it?

Some Spanish words turned directly into English forms may enrich our language. But I only came across one such desirable (or, at any rate, unobjectionable) case of this influence of Spanish on English. The Spanish word *aquerenciar* is used in Argentina of so attaching a cow to a certain camp that she no longer seeks to leave it; thus a cow becomes *aquerenciada* to a new camp when she has had a calf there. So when an English wife has become reconciled to her estancia life and has settled down she may be said to be *querenched* to it. The word is not pretty, but it is expressive and not barbarous; it represents, quite fairly, the assimilative powers which are so remarkable a feature of our language.

Denationalisation of Immigrants.

In this matter I can only speak of my experiences in "the camp," and so I pack this note also into the present miscellaneous chapter.

I remember how often I have met Swiss and Italians from the United States and elsewhere drawn back to their native countries by home-sickness, and how New Zealanders and other dwellers in Dominions or Colonies look to England as "home."

In Argentina, in the camp, I did not find this *Heimweh*. Neither Swiss, nor Italians, nor English seem to prefer "home" to Argentina.

And this does not mean that they have transferred their allegiance to a new country. I do not think that any one will contradict me when I state that

there can hardly be any country where the sentiment of patriotism for their adopted land among immigrants is weaker than in Argentina; where there is among these less of the spirit that makes a man ready to fight or to make sacrifices—not for his property or his family, but for the land of his adoption. Argentina is, in fact, as yet too impersonal to excite such a sentiment; it is a vast space scantily occupied by various unblended nationalities.

No; I am convinced that the dying-out of longing for and interest in the fortunes of their real native lands, which I believe to be in evidence among the immigrants into Argentina, is not to be ascribed to any true transference of patriotism, but rather to the spirit of materialism that rules the country and gradually infects those who come into it. This is, I imagine, the weak point of new lands.

The present generation of older Englishmen, born in England, now settled in Argentina, are, I venture to think, in a position that is unfortunate both for themselves and the country. For by Argentine law they are not Argentines (since they have not been born in the country and, we may safely assume, have not naturalised themselves), and therefore cannot play any part in managing public affairs. [Privately, I am inclined to suspect, though I may be wrong, that the true Argentines don't want any Anglo-Saxons, whether born in the country or not, meddling with either politics or "justice"!]

Hence they are limited to the pursuit of wealth,

and the big English estancieros lack the healthy influences of the public duties which fall to the lot of the "squires" in England or of the wealthy settlers in our Colonies. So, I say, the position is in one sense unfortunate for them.

It is unfortunate for the country, too. Can any one assert that, in general, "justice" is in a satisfactory condition in provincial Argentina, in the "camp" and in camp towns? Would a peon even, of Argentine race, to say nothing of an Italian colonist, have (again "in general") any chance against an important or wealthy man unless the latter happened to be no friend of the magistrate's? I do not mean to say more here than what would imply that provincial Argentina is to-day where provincial England was a long time ago. Well, to come to my point. Here everywhere are good specimens of that Anglo-Saxon race whose special gift lies in the direction of ability to manage public affairs and to administer justice in a way that inspires confidence among the lower—indeed, among all—classes; and everywhere they remain unemployed in these higher functions. So I say the position is an unfortunate one for the country also.

Will the next generation of English born out there, and therefore legally Argentines, sent home to the Old Country to be trained in our public schools, and therefore fully imbued with our best English traditions, ever play a part in public affairs in Argentina and influence the tone for good? I cannot say; but if this is ever to come about, it must be through their wishing

it and the true (or Spanish) Argentines acquiescing. But I would venture to predict that when, or if, it does ever come to pass, those of English race who thus take part in the direction of Argentine affairs will also take a keener interest in matters concerning the well-being of the British Empire, to which they will still by race belong, than at present they appear to me to do. As I said before, it is the limitation of men's energies to the pursuit of wealth, or what I have called materialism, and not patriotism for the new land, that deadens the sentiment for the old home of their race.

CHAPTER VII

THE HISTORY OF A LOCUST INVASION

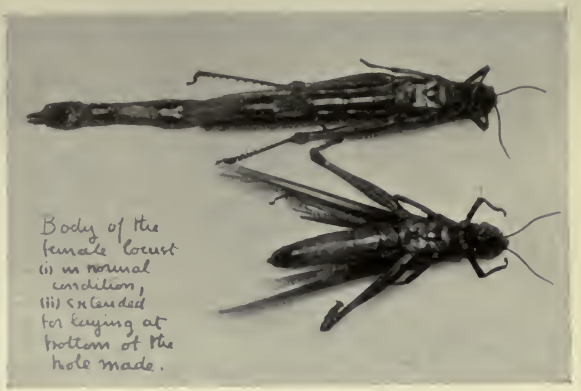
(*Schistocerca paranensis*)

On October 18th, not long after I arrived at the estancia, I went out one day (as I have mentioned before) and climbed up on to one of the windmills to view the country and its emptiness. The gulls, of whom a number always stay about each estancia, appeared to be rather excited; and, looking up towards the sun, I thought that I saw the reason. For, high up, there was a thin drift of locusts, whose gauzy wings caught the light and made glittering specks in the air near the sun; away from the sun I could see nothing of them, for they flew high and in very open order.

On October 25th we drove out to visit some colonists, and at first things were as usual; though, no doubt, had my attention been called to it, I should have noticed a haze on the horizon.

But soon we were in a drift of locusts; and, seen edgeways, the cloud (which I suppose covered many square miles) formed a purplish haze that made the horizon, usually as sharp as the rim of the sea, quite invisible. I remember how one glittering windmill

1



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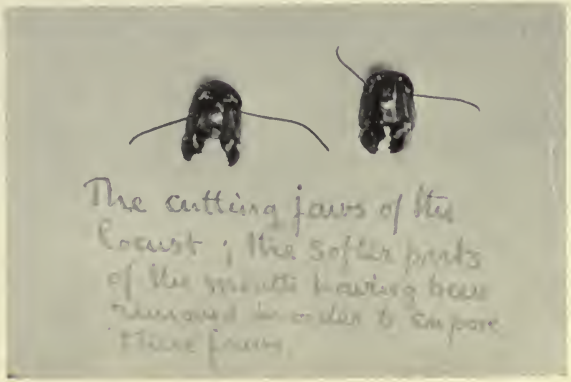


2

4

1. THE LOCUST OF ARGENTINA, *SCHISTOCERCA PARANENSIS*. 4. A BUNCH OF LOCUST'S EGGS.
2 AND 3 NEED NO FURTHER EXPLANATION.

To face p. 118.

caught the sun and shone out of the cloud as a light-house out of a fog bank.

On our way home we passed a puesto that had some willows (sauces) round it. The locusts had alighted on these and loaded them, clinging on (as usual) with their heads pointing in the same direction, viz., upwards. And I noticed for the first time the curious glimmering, brown-gray, streaky appearance that this locust-load gave to the trees; an appearance that later became very familiar to me. These swarms of locusts came (so it is believed) from the Gran Chaco and other vast empty regions further north. They came for some eight or nine days to breed and to lay eggs; they practically ate nothing—that was not their business then. Night after night they roosted, out of reach of the dew, on the sauces and other trees, and yet I could not find any signs of eating: only some of the vegetables in the garden suffered a little, and here and there some maize was touched. As the sun dried the herbage they descended from their roosting places to the ground; and during the latter part of the eight or nine days, when laying began to be conspicuous, they got very sluggish and no longer rose; one trod on them. A large female (the males were smaller) measured as follows:—

Across the spread wings	$4\frac{7}{8}$ inches.
From tip of head to tip of closed wings, antennæ not included	$2\frac{13}{16}$,,
From tip of head to tip of tail...	$2\frac{1}{2}$,,
Length of straightened jumping leg	over $2\frac{1}{4}$,,

The colours of both male and female were dull; a dull olive-green, black, and dull brown. [The new race, developed later from the eggs as described below, were brighter in colour.]

I think that one can say with certainty that the locusts choose for their laying-grounds bare earth, fairly beaten and hard; in fact, the "roads" receive most of the eggs. Probably they lay also on the small bare patches that occur here and there in the alfalfa paddocks; probably *not* on the loose ploughed land of the colonists' holdings, but only on the temporary roads that are made along and across them. The female locust is most ingeniously adapted for boring holes and laying eggs in them. At the end of the tail there is something like a pair of jaws; there are two talons bent upward on the upper "jaw," and two bent downward on the lower. The jaws are thrust, closed, into the earth, and are then opened out. Thus, bit by bit, a hole is made and the locust's body is dragged down into it. The earth is not excavated (save, perhaps, just at first), but it is pressed sideways by the body when this is pulled inward against the resistance of the jaws (which are anchored at the bottom), and thickens as it is pulled in. It is quite noticeable that a patch of road where many locusts have made their holes and laid eggs rises somewhat above the adjacent level. The sinking of the body goes on until all that part of it that lies below the thorax (*i.e.*, on the tail-side of the thorax) is beneath the surface.

Normally this part of the body is about 1·16 inches long and is completely protected by scaly rings of about ¼ inch wide that overlap. But in the laying locust this will stretch to as much as 3·32 inches long, the rings then being separated and a transparent membrane appearing between them. Eggs are laid in an elongated bunch which is covered with a glutinous foam, and the hole above the eggs is filled with the same. This appears to dry up later; it probably serves to cement the eggs together, and to harden the walls of the hole so that they may not fall in. A bunch may contain from 80 to 120 eggs, and be about 1⅓ inches long; and the hole above will be perhaps 1⅔ inches deep, its total depth being thus about 3 inches. But numbers and dimensions vary a good deal.

The cutting jaws of these locusts are very powerful; and I removed the soft parts of the mouth and photographed these shears of black enamel. From the top of the head to the bottom of the shears is about $\frac{9}{20}$ inch.

As said already, the first swarm (or manga) of locusts came on October 25th. The laying was mainly on October 31st, November 1st, 2nd, and 3rd. On November 3rd the numbers had lessened perceptibly. And on November 4th one may say that the locusts had gone, leaving behind them the seeds of a plague that must be seen to be believed in. But crops and grass were uninjured so far.

What can be done? To drive sheep over the laying locusts, or to beat them with wire flails, produces a heap of slain. But, half-an-hour later, all is covered again. And then, look at those miles and miles of roads, all laying grounds, running everywhere through the empty land!

"If seven maids with seven mops"—

we all know Lewis Carroll's poem. Certainly I believe that the best chance of reducing the plague would be, theoretically speaking, to plough and harrow all roads and bare spaces after the laying locusts have gone and before the eggs get so ripe as to be hatched by, and not killed by, exposure to the sun. But it is a hopeless task at present. Even could a plough be got into the hard earth, and the inconvenience of having no firm roads for the carts be put up with, the population is far too scanty for the work.

. . . . . .

The laying locusts had gone, and things looked as usual again; I did not at all realise the inevitableness of the coming invasion. But about three weeks later I saw the men putting "tin petticoats" on the fruit trees, and surrounding a part of the garden with some 360 yards of tin barrier 18 inches high. [More was enclosed later.]

And then one day, it was November 27th—*i.e.*, the predicted month after the beginning of the laying—

someone said to me, "*They* are hatching out on the drive!" So I went out to look. A harmless-seeming sight enough it was. Here and there were to be seen a few white specks and some little green things; that was all. I examined more closely, and saw the little wingless locusts, about ¼ inch long and of a tender green, scrambling up out of the earth quite regardless of each other's feelings, one treading on another. They appeared to come up with some of the white egg-skin on, chiefly a bit that tied the hind legs together, and of this they at once tried to get rid. They soon got out and scattered, leaving a litter of bits of egg-skins behind them. It seemed to me that in a few minutes, or in a quarter of an hour, they got dark in colour. [In the illustration—I *hope* it will be reproduced well from the photo that I have by me! —we can make out the little locusts and the bits of white egg-skin; and should also be able to make out one small creature trying to disentangle its hind legs from the embarrassing bandage.]

I will first make some general remarks about this locust (which is called the *Schistocerca paranensis*) and its life-history, and then will return to describe in some detail our unavailing warfare with them, the ravages they inflicted on us, and the inconveniences that they caused.

As to their general history, it is one of progress from stage to stage; in each stage there is growth, and then a change of skin, a further and more abrupt

increase in size at this change being very noticeable. And there are, I read, six changes of skin.

But the advance of the locust, from its first hatching, through these various stages was rendered less easy to observe owing to the fact that there was, no doubt, on the estate a mixture of swarms of various dates of hatching. Certainly there were at least three stages in evidence, at one and the same time, up to near the end.

As regards the Spanish names used, I may say that, properly speaking, the locusts are "saltonas" (that is, hoppers) until the last stage is reached, when they come out with wings and are mature locusts; and then they are called "voladoras" (or flyers). But during the first few stages they have the nickname of "mosquitos"; this word, familiar to us as applied to gnats, being merely a diminutive of "mosca," and meaning "a small fly."

Nature appears to make one or two attempts to provide the creature with wings before she finally succeeds. In the last change of skin but three the saltona emerges with minute, but quite visible, abortive wings (called *wing-pads* in a report of a Locust Commission of 1898); in the next, with wing-pads rather larger; while in the last stage of saltona they are very conspicuous though still quite useless. At the last change (viz., to the voladora), they come out with full-sized wings, though these are at first damp and crumpled up. Nature seems then to make a big jump, and to succeed suddenly.

THE HATCHING-OUT OF THE LOCUSTS.

BURNING YOUNG LOCUSTS.

To face p. 124.

In the changes the legs are (I believe) drawn out of the old legs, the antennæ (advancing in the number of their joints) out of the old antennæ. But I came to the conclusion that the new wing-pads, or (at the end) the wings, came out from underneath the old skin, and not out of the old wing-pads.

In the earlier stages the little locusts progressed by hopping. They appeared to hop at random, and to come down with their heads in any direction whatever; yet on the whole there was a steady drift of the seething, skipping mass—like sand-fleas on hot sand—in one direction. And the smaller they were, the better could they cling to and climb slippery surfaces. The very small ones could climb up inside an *inverted* tumbler.

The larger they grew, the less they hopped and the less they could climb. The great destructive armies of saltonas in the last stage never employed hopping as a method of progress, but marched with persistence and purpose; and they could not climb smooth surfaces well. Even top-boots, overhanging as they did somewhat at the ankle, baffled the big saltonas. But they could to some extent climb barriers at the cracks where the tin-strips overlapped; and, if one in a thousand succeeded, that was enough for devastation on the other side!

Of course, no barriers availed when the locusts reached the voladora stage. One had to be content with having had some fruit and vegetables up till then, and one hoped that they would soon fly away.

In all stages the saltonas had relatively big heads (see illustration opposite p. 128), erected in a curiously impudent way, so that their aspect excited dislike; one got to feel them to be obstinate and impudent personal enemies. The colours, too, yellow, red, black, and green, were annoying. This feeling of personal hostility diminished (with me, at any rate) when the voladora stage was reached and the ugliness and look of impudence vanished.

In all stages too, including the last or voladora stage, these new locusts were singularly oily or juicy as compared with the old ones that came to lay; and this juiciness made the attempts to burn the mosquito saltonas markedly unsuccessful.

In all stages they roosted above the ground at night, getting into the warmth of the setting sun; and on very hot days they climbed up posts, getting on to the shady side of them, and even up grass-stalks, to get away from the baking earth.

To complete this general survey, I will give some dates.

On November 27th they began to hatch out. By December 24th they were several stages on, and were ½ inch to ¾ inch long. About January 9th I began to notice the change to the last stage of saltona, which was some 1½ inches long. Change to the voladora stage began about January 16th; and about January 25th the voladoras predominated in numbers. By February 2nd (when I left for the Andes) voladoras predominated greatly, and the remaining

SCOOPING UP SALTONAS WITH THE CARCARAÑÁ.

DRIVING SALTONAS INTO PITS.

To face p. 126.

saltonas were meditating the final change and were not eating much.

The latter part of February gave a story of flights going away to north-west—it is believed that they go northward round by the west—and of other flights, also on the move, alighting in passing. When I returned on March 18th there were only a few here and there, like grasshoppers with us in England; and the last I saw of this terrible plague was a passing cloud, high in the air, on March 23rd, drifting in their curious way at 45° or so to the wind. [If there were, *e.g.*, an east wind, you usually saw the locusts, with their heads pointing north, flying northward, but on the whole drifting in a north-westerly direction. They appeared to wish to go north, but to be disinclined to face the wind at all.]

I will now return to the hatching-out and give some details of our experiences. And I will say at once that, beyond temporarily protecting the garden and fruit trees against the saltonas, so as to put off the evil day of destitution (in fruit, vegetables, and flowers), as long as possible, *i.e.*, until the locusts reached the voladora stage, the fight with them was quite useless in such a big invasion as this. Had we killed none, more would have died of starvation; that is all. But we had to satisfy the Locust Commissioners and to show corpses strewn about and pits filled.

In the earlier mosquito stages we could burn them in some places; viz., in the garden, on roads, and in

such paddocks as had degenerated back to the wiry and inflammable puna-grass. In green alfalfa they had too much cover.

The plan was to look out for mangas by noticing the brown appearance given when they roosted early and late on the thistles and on the tops of the grass-stems. A barrier was then erected to leeward of them, and we advanced on them down the wind, working with burning lino-straw, or with "naphtha machines" invented for this purpose, the puna-grass catching fire and helping us. [See illustration opposite p. 124.] We then got deep carpets of the small things up against the barriers, and the flames seemed to wither them up and turn them white and red. But, alas! ten minutes later all would seem to be alive again; the fact being that they were so juicy that the top layer protected those underneath, and the latter soon came to the top. About December 24th we had to give over burning, since the whole camp had become so dry that there was danger of starting a fire that would reach the colonists' crops.

[I may mention too that the undergrowth in the home monte, a grove of paraisos, sauces, and acacias, would readily have caught fire; in which case, all the trees would have been destroyed. So we had to abstain from burning in the neighbourhood of the monte, though in it and around it were millions of locusts.]

By December 28th they had become big enough

CHANGE INTO LAST STAGE OF SALTONA.

LAST STAGE OF SALTONA.

MARCH OF SALTONAS (LAST STAGE).

To face p. 128.

(say from ⅞ to 1 inch long) for another method of attack to be adopted.

In this a big iron scoop was employed, which is called a "carcarañá"; the name, I think, of the town where it was first used. [See illustration opposite p. 126.]

This is about 10 feet long, and it is dragged by means of a rope at each end attached to the saddle-rings of two horsemen who keep level with one another and sweep the manga at a canter. In the illustration this scoop is somewhat sunk in the alfalfa, and is not well seen.

Pits, 12 feet long by 3 feet wide and 4 feet deep, had been dug, and the scoop was emptied into them. When full, the pits were covered in with earth. While filling, projecting sheets of tin kept the locusts in, or else a boy was employed to beat them down with a branch. But twenty such pitfuls, representing some 2,800 cubic feet of smallish locusts, made no difference! It merely meant that one locust in a thousand (or in 10,000, or in 10,000,000?) had perished.

Rather later, on January 5th, I went to witness another mode of destruction. In one paddock the pasture had become so short that there was no danger of a prairie-fire. So barriers were set up converging to a pit whose borders were guarded with overhanging tin sheets; and a manga was driven in by men with naphtha machines, working down the wind, the heat and smoke of the smouldering herbage helping. [See illustration opposite p. 126.]

At last—somewhere about January 9th—began the worst period of the plague, when large numbers of the saltonas had reached, and daily vaster and vaster masses were reaching, their last and biggest stage before the final change into voladoras.

It was now no longer a question of looking out for mangas; these big 1½-inch hoppers covered the whole country and marched in huge armies along the roads, or across them from paddock to paddock. With their big impudent heads, ugly colouring, and caterpillar-like bodies, they were well adapted by their appearance to heighten the loathing which we felt for them. They occupied our mental vision; we saw them in dreams; I see them still! We could now make them walk into pits, guiding them by barriers; but it made no difference. Flocks of hawks and eagles, seen at no other time, came (literally by the hundred) and devoured them; but it made no difference. They ate each other; they got drowned (by the cubic metre) in drinking troughs and wells; we trod on them and beat them down with flails; they died for lack of food or attacked by parasites—but it made no difference! If you had not put on slippery top-boots, and if you stopped for a moment anywhere out of doors, you were soon covered with them. Innumerable as the sands of the sea! They choked the machines that were threshing linseed; and it began to turn out an oily pulp instead of clean seed!

Alfalfa was eaten down to the ground; the leaves,

SALTONAS ON THE WALL OF THE HOUSE.

To face p. 130.

bark, and even the tenderer wood of the sauces and acacias was devoured; they attacked clothes, and even the hard silk-and-wood houses of the bicho de canasta. I saw one begin to eat, alive, a brother-saltona that was changing its skin and therefore helpless; and I could not feel much compassion when, later, I saw a praying-mantis begin to eat a saltona alive.

Oh! the bareness and heat of the camp in those days; and the sickly locust-smell—something between that of bad hay and guano! It required much doggedness to go on photographing under these conditions, and developing in the now baking dark-room; but I did it. I wish that I could reproduce here the whole series of my photographs; but there are far too many.

In spite of the loathing that one had acquired for all locusts, it was interesting watching the last change—from saltona to voladora—taking place. The voladora emerged with its wings damp and crumpled, and its long hind legs limp and useless. So, before it was quite free, it bent up and got hold of the twig or grass-stem with its front legs, and hung there until its wings were expanded and hind legs strengthened. But I think it was some days before it could fly far; and up to the very last it remained a much softer insect than the old voladora that had come down from the north in spring to lay eggs. Further, it was practically of the same size as the

old, but had not the same tone of colour; there was a good deal of a warm pink-brown about it, and it was more translucent in the sun.

These new voladoras soon covered the ground everywhere and rose in short flights as one walked. They seemed anxious to eat; but there was little left for them. I saw them eating dead locusts, twigs, bark, hard quinces—anything they could get. As evening came on, they went to roost on trees, stacks, or undergrowth.

With the arrival of this last stage in the life-history of the locust, the interest of the invasion, for me, came to an end. The rest was simply a matter of more complete destruction of whatever could serve as locusts' food. I soon went off to the Andes; but some further notes were taken for me at the estancia. I learned that, all February, voladoras went away to south-west, west, or north-west, though one flight went eastward. [They are believed to work round to the north and to make for the Gran Chaco and other empty lands and to winter there.]

A noticeable feature this year appears to have been the very large quantities found dead at the foot of trees, posts, and other roosting places. The capataz thought that hunger had killed them; but another man said that he had found gusanos (worms or grubs) in the bodies; and this would suggest destruction by some parasitic fly. Perhaps both views are right, the locusts having been so weakened by hunger as to succumb to parasitic attack.

1

2

MAIZE (1) BEFORE, AND (2) AFTER, THE LOCUSTS HAVE REACHED IT.

To face p. 132.

It was curious to note what the locusts did *not* eat.

1. *Paraiso* trees. These were untouched. Yet they roosted on them, and so cannot dislike their smell.

2. *Canes.* This is a tall native cane, some 10 feet high, that looks not unlike maize. It was untouched.

3. *Onions.* Untouched.

4. *Cucumbers.* The fruit never touched, nor, I think, the leaves or runners.

5. *Sweet melons.* The fruit never touched. But it seemed both to me and to the Swiss gardener that they bit the leaves and runners [sometimes severing the fruit and so killing it], though they did not devour them.

6. *Sandías* (water melons) and *zapallos* (pumpkins). The case of these is strange. The locusts ate the leaves and runners; and one would conclude that the juices of these plants are not injurious to them. Yet, when they were eating dead locusts, wood, bark, and hard quinces, they did not touch these plump, relatively soft, and tempting fruits! Everywhere in the garden I saw untouched sandías and zapallos whose leaves and stems had vanished entirely.

7. *Certain flowers.* I think sweet-williams and foxgloves were untouched.

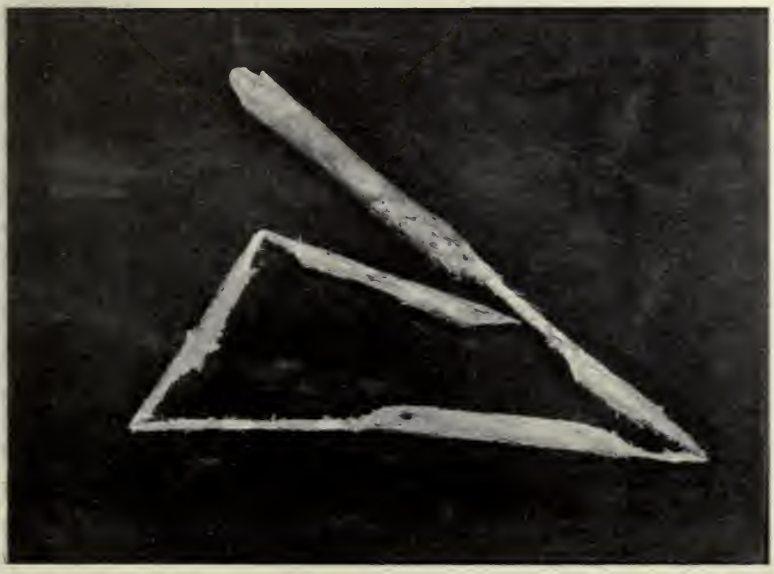
8. Of other trees, I understood that they are not very "keen on" the eucalyptus, and that consequently these are fairly safe from them if they have other things to eat.

From my account of the locust invasion it will seem wonderful that a country can prosper where such plagues recur for years together. Well; I think I can show how this is possible; and I will take the questions of agriculture and stock separately.

1. *Agriculture.* In the invasion that I witnessed the locusts reached their full devouring powers too late to eat the wheat and linseed. My brother's colonists had but little maize, and the loss of this did not much matter. Had their one crop been maize, they would have had a ruinous year. But it must be remembered that a bad year does not mean the same thing to men who pay a quarter of the produce as rent as it would to men paying a fixed money-rent.

2. *Stock.* Up to the present time one may say that in general the land is held by proprietors of large estates who have in the past paid but little for it, and who at any rate have no rent to pay. If an owner is content to make, let us call it, £4,000 a year out of every square league of his land, instead of trying to make £6,000 out of it, he may put on the camp only two-thirds the stock that it would carry. Hence he can make as many stacks as he pleases of alfalfa-hay and of silo, and can let the alfalfa much outgrow the eating powers of the stock. The locusts come, and the alfalfa is gradually devoured; I saw the camp almost bare and very brown even before the locusts began to go. But there is always the hay to fall back on; and, if rain comes soon after

SALTONAS EATING MAIZE-COBS.



WILLOW-TWIG BARKED AND GNAWED BY LOCUSTS.

To face p. 134.

the locusts go, the alfalfa springs up again as by magic; the cattle soon get fat again, and more hay can be made before winter.

I may add that the locust plague did not prevail with like severity everywhere. Round the railway junction Junin, for example, distant some two hours and a half by rail from my brother's station of Villa Cañas, there were practically no locusts at all that season; and even at Villa Cañas, only 12 miles or so from Santa Isabel, the maize was not completely destroyed nor the "sauces" barked.

But, taking all in all, no doubt the locust invasion would be ruinous were the country full and were rents and income more equally matched.

More than once my brother said to me, "What is the *use* of locusts?"

Well; in nature both pests and their destroyers, taken together, seem unnecessary; but the combination is useful, granted that the pests must exist. It is a question of balance.

And in somewhat like manner, it seemed to me, the locusts may have their use. When I noticed how the alfalfa that had been regularly cut had survived for twenty years, while that which was never cut and was understocked had degenerated after five years, the question occurred to me: "Granted these vast plains of native grasses which far outgrow the eating powers of the native wild animals, is it possible that the locusts, devouring it

and leaving excreta and dead bodies on the spot, have kept the plains in better condition than they would have been without these invasions? May it not be the case that man with his herds of cattle has disturbed the balance, and that this is but a time of transition? When all the land is occupied, will not locusts be kept down and the balance restored?" I am not suggesting that locusts are a blessing; only that we may be witnessing a striking case of a balance disturbed by man.

Why not, indeed, regard the Pampas as the feeding-ground and the locusts as the natural wild animals feeding on it—as bison elsewhere? But I am out of my depth here; I believe I have accidentally got into teleology, when I intended only to give the actual history of a locust invasion!

CHANGE TO LAST, *I.E.*, VOLADORA, STAGE.

NEW VOLADORA DRYING WINGS AND LEGS.

To face p. 136.

CHAPTER VIII

SOME NOTES ON A FEW OF THE ARGENTINE BIRDS

[*** I do not attempt to make any list of birds, nor to classify those mentioned. I merely give in these notes a few things that struck me as an ordinary lay observer. The measurements are taken from my brother's notes.]

The Rhea, or Argentine Ostrich.

Of the more common denizens of the Argentine plains, the "rhea" or native ostrich is perhaps the most interesting.

The general plumage of the cocks and hens is much the same. They are nearly black on the top of the head, down the back, and in the front of the breast; dirty white in the front of the neck; and white on the belly, rump, and thighs. For the rest, rich browns and gray-browns prevail; and, indeed, the "black" is rather a dark rich brown. When the creature opens and droops its wings, as it runs away from you (as the cock bird always does when leaving a nest of which the eggs are in a fairly advanced stage), the body, thus seen from behind uncovered by the wings, appears to be mainly white.

The cock is bigger than the hen, its colouring

more handsome, and the feathers finer; these feathers are hardly handsome enough for wearing in hats, but make very good fly-brooms. The cock, when it stands well up, certainly looks down on a man; but it is extraordinary how inconspicuous it can make itself when flattened on its nest.

The cocks do much as stallions do: the stronger birds collect a harem of hens. In fighting for mastery they push and wrestle with their beaks, but do not kick one another; so my brother told me. The various members of the harem contribute to the same nest, and eggs up to some fifty or so in number are there collected. The peons told me that "forty eggs, and forty days to hatch them" was the average. I suppose that the eggs laid later, getting more warmth than those laid earlier, develop more rapidly. It is the cock bird that sits; and he sits very close when the eggs are in an advanced stage. A bird that will move off when you come *on foot* within two hundred yards of it as it grazes, may let you photograph it at ten yards, and come to within six yards of it, when sitting. And it is remarkable how, when it does leave its nest, it almost invariably trails its wings and tries to draw you away. I have seen them move over the tall grass like boats with sails set; those boats that one sees on the Lake of Geneva.

It is unfortunate that, of several photographs that I took of ostriches thus leaving their nests, that which was best adapted for reproduction shows the bird with wings closed—an exceptional case.

COCK OSTRICH (*RHEA*).

BABY OSTRICHES.

To face p. 138.

The largest egg that I came across was $5\frac{3}{4}$ inches long, and $3\frac{25}{32}$ inches in its greatest diameter; and its weight was 1 lb. 10 oz. I remember that once in 1888, when walking in the monte, I was suddenly greeted with an appalling hiss. I started back in alarm, and saw that I had nearly trodden on a wicked flattened head and gaping mouth, behind which lay what appeared to be part of the body of a huge snake. It was the head and neck of the cock ostrich which then hung about the estancia—(it was called "tame," which meant that it would attack a man on foot or a man on horseback without any hesitation)—and it was sitting on its nest. The resemblance to a snake was most striking.

The cock bird hatches out the young ones and then takes them about with it; and a most absurd sight it is to see this great bird, so decidedly male in appearance, and so irritable-looking when you get near it, acting as nursemaid to some thirty or forty children. The most characteristic sound that it makes is a sort of booming; but it summons the young ones by making a gargling noise, and the young call to it with a very sad kind of piping whistle. [I remember that a young Italian colonist, who had brought up some young ostriches by hand, summoned them by gargling at them.]

The cock bird has no fear when the young are with it. It will move off if the young follow it; but if a young one hide and stay behind, the bird will turn back and charge even a man on horseback. No

horse can stand this, and the only thing you can do is to gallop away. On foot you are safe. For the bird does not *dart* its head at you as a heron does; and you can easily catch its neck behind the head and hold it down, so that the bird cannot kick you, and can choke it mildly until it feels unwell. Then you can let it go. It will probably tumble over backward and make off sulkily. I had much experience of this with the "tame" cock ostrich in 1888. But if you held the head up, I think you might well be ripped up by its kicks, for its legs are tremendous machines.

The bird, by the way, readily deserts its nest, even breaking the eggs up if they have been touched. Hence I was not able to count exactly the number of eggs.

In walking, the ostrich has its wings closed, and it swings its long neck backward and forward; not in time to its steps as a common fowl does, but quite twice as slowly. In running fast the wings are usually raised above the back, but not opened; they thus form a sort of wedge, and offer little resistance to the air; perhaps also the bird then finds its thighs freer and cooler.

In sporting about, when their movements are very queer and freakish, or when pressed by dogs, or when leaving a nest, the wings are expanded and drooped, and the head and neck often held much lower than in ordinary running. Possibly the wings then serve to baffle a dog (or tiger-cat) in its spring at the bird's neck. My brother used to hunt them in old days and

told me much about them. He mentioned also a habit that they have, when pursued, of suddenly dropping and hiding in the grass. He lost one in this way. They have, by the way, three toes, while the African ostrich has two only.

The Teru-tero.

Wherever one goes, over wild camp or tame, one finds the Argentine peewit, called, from its cry, the teru-tero. As a matter of fact its cry is often single; and when broken by an *r*, so as to sound like "erew," it is not repeated in pairs, as this name would suggest, but is "erew, erew, erew, erew," over and over again.

As you see it on the ground it seems to have an olive-brown back, black "shirt-front," white on the rest of the chest and belly; and when it spreads its wings you see their handsome marking, white in the front part and nearer the body, black at the tips and at the ends of the main feathers. The teru has a crest, and a sort of horny red spur at the main joint of the wing.

Like a peewit it tries to lead you, or to scare you, from its nest or young; but it does not pretend to be wounded. Very often it charges full steam at your head, making a sharp turn when some two yards off. At other times it alights near you, crouches down to watch you, and then hurries away with head bent down, as if it had suddenly remembered a previous engagement. There is something

very human about the bird; but it does not trust man, and is much less tame than many other birds, though no one ever molests it. It looks singularly brisk and practical, neat and well-dressed.

If you have not a headache, and don't want to work out a problem as you ride, the teru-tero certainly adds to the cheerfulness of the camp; but I got very tired of it.

The Lechuza, or Small Burrowing Owl.

[Length from beak to tip of tail, 9¼ inches; span of wings, 2 feet.] Speaking in a general way, and not with scientific exactitude, I should say that the little lechuza occupies the top of every fence-post in the Argentine, never sleeps, and has its head fitted on with a peg, so that it can turn it quite round without strain while observing a passer-by.

It seems to be out all day long, sitting on these posts. If you come too near, *i.e.*, within about six yards, it gives a sort of "squirring" note—(an onomatopœic word)—like a partridge, and then a vigorous "bick-bick-bick," like a suspicious blackbird; and either goes to another post or comes over you to inspect you carefully from a distance of some eight yards. The above are its two notes in the daytime.

If you pass one seated on a post, and do not go too near, it steadily regards you, turning its head as on a peg. Certainly it is *quite* happy when looking clean over its own tail; that I can

answer for. They always reminded me of those artificial birds, connected with Christmas-time, that had removable heads; for we children used to put their heads on wrong way round.

They hover much, like kestrels. When dogs pass, they often dash at them and seem to touch them; I have seen a terrier leap up into the air after them.

One day my brother saw one of these little owls flying close over the grass, bearing some object about as big as itself. He chased it on horseback and made it drop its load. To his astonishment, this proved to be a young ostrich that he judged to be heavier than the owl itself! The father ostrich could almost have swallowed this ambitious and determined little bird of prey.

My brother, who knows birds well, told me that it was a night-bird also, and that then it had a proper owl's hoot.

The colour is on the whole brown, buff, and dirty white, and there is a very pretty mottling.

Big Owl.

There was also a big [slightly horned] owl, 1 foot 3 inches long and 3 feet 3 inches across the wings. This appeared to be really nocturnal in its habits; but it was not the least confused, nor was it mobbed by other birds, when disturbed in the daytime. One of these came close over me, very gravely inspecting me.

The Chemango.

Of the various hawks that I saw at Santa Isabel in 1888, there remained in 1908 only the chemango; or, at any rate, other kinds were but rare visitors. This is a carrion hawk (which eats beetles and grubs, &c., also) about 1 foot 3 inches long and 3 feet across the wings; it is of a dirty white underneath, while, above, warm reddish-brown and reddish-brown-buff colours prevail, only it has two dirty white bars on the wings.

The main characteristic of this bird is its intense vulgarity. It does look so very common. And then its voice! Take (so to say) the ordinary harsh scream of any self-respecting hawk, and stretch out an inch of it until it becomes a foot—so that all the fibres show—and there you have the drawn-out scrawky cry of the chemango. A mocking-bird might imitate it if he wished to insult a dignified eagle.

I discovered the real use of the chemango: it is to be photographed, sitting or flying. There could not be a better subject for the study of birds on the wing. But it can (and does) lay handsome eggs; white covered with warm red-brown splotches.

All camp-birds in these districts have to lay on the ground or under it; there are no trees or bushes in the flat alluvial pampas. The chemango lays on the ground.

Like the teru and lechuza, the chemango—with a courage foreign to its vulgar nature—will charge dogs (and sometimes men) when near its nest or young

ones. I once saw one actually strike a collie on the neck; there was an unmistakable shock and check in its flight.

By the way, what *did* chemangos and lechuzas do when there were no posts and railings in the camp to sit on?

The chemangos undoubtedly eat carrion, as do the gulls; but both follow the plough, like rooks in England, to devour the grubs, &c., turned up.

The Pechicolorado (*pecho colorado* = red breast; but I give the word in its dictionary form).

One of the most attractive birds, as well as one of the commonest in the alfalfa paddocks, is the pechi-colorado. Everyone who knows it must admit that in beauty it beats our robin hollow. And though it does not come about the house, or in the garden "eye the delver's toil," as our robin does, still it is no gaudy tropical bird that one could admire but not get fond of; rather, it is a bird that one admires and likes—as one does the lark or thrush.

Its size is about that of the starling. Keeping to the adult male, so as to be on sure ground, I may describe it as mainly of an intense black; only there is what looks like a white streak along the side of the head just above the eye. Its glory lies in a magnificent crimson breast of tropical brilliance that shines out in the sun and catches your eye at quite a considerable distance when the bird is seated on a fence or on the top of some tall plant. You certainly notice

the crimson "flash" at distances at which the bird itself would pass unnoticed. The "shoulders" of the wings have also some of this crimson on them. It—the male, I imagine—has a curious habit of soaring up some twenty yards or so, and then descending with wings spread, tilted somewhat upwards and motionless, and tail expanded wide, uttering a pretty phrase or two of song; taking to flying again when it nears the ground. I suppose that it is showing off to the female; and I take these latter to be browner birds that I saw, having a much pinker, or less crimson, breast. I trust that women will not have these beautiful and harmless little birds slaughtered for the adornment of their hats. In spring and summer these birds go in pairs, but in autumn and winter they associate in considerable flocks.

The Common Stork, or Cigüeña.

These birds are (from tip of beak to tip of tail) 4 feet 1½ inches long; spread of wings, 7 feet 7½ inches; length of leg, 2 feet 2½ inches. The general impression that one gets of them is that they are handsome birds, mainly black and white. Like all the long-necked and long-legged birds that I know, except the heron, they fly with both neck and legs extended. This bird is one of those that, when once high up, continue to rise in spirals without flapping their wings.

My own belief is that the birds discover local upcasts of air (such as those that give cumulus clouds)

and circle so as to keep in them. If this view be correct, they are, relatively to the air, always sliding gently down an inclined plane; but, relatively to the earth, are on the whole up-borne. For this, great spread of wing would be required. I don't believe in "screw-action" myself. Was it not Professor Langley who first laid stress on the necessity of considering the actual conditions of air-motion instead of assuming that the air moved uniformly and horizontally? Watch paper and feathers in the air, and you will see what a bird of big wing-area might do by sliding about from one favourable place to another.

The Partridge Race.

As far as I can say, I came across three species of this race.

There was the big *martineta*, like a short-tailed hen-pheasant. This was rather tame, and soon got tired of rising and would try to hide. Then a small partridge, still more tame, and still less inclined to rise. And finally a *very* small partridge, absurdly tame. This can be noosed with a piece of string at the end of a cane.

It used to look rather ridiculous when a man with a gun was, on a hot day, chasing a partridge in order to make it rise. But one usually had to do this.

Many other camp birds I saw; but I do not think that I have much to say about them. Only I must mention the masses of *flamingos* that were sometimes

to be seen at the edge of the salt laguna near Melincué. It was beautiful to see them rise, and to note the two other colours—vermilion-scarlet and black—that were then added to the rose-pink of the sitting or wading birds. I saw flocks of many hundreds.

I saw, alas! no more of the beautiful *spoonbills* and *egrets* that I used to see in 1888–9; and I could no longer visit the larger lagunas to search for the *black-necked swans* and other interesting water-birds. All was "trespass" now, and I had to keep to the dusty roads. But the spoonbills, egrets, and various other birds had really gone; everywhere the wild life was disappearing from these regions.

Of the numerous species of *ducks*, I will only say that I heard from them whistling sounds, not quacking.

I will now turn to some of the birds that were not seen, or seen but rarely, in the open camp, belonging rather to the house and the plantation about it.

The Hornero, or Oven-bird.

While I was at Buenos Aires, when I went to the races at Hurlingham, I noticed strange objects up on the cross-bars of the telegraph posts and in other conspicuous places.

These turned out to be the mud nests of the hornero. The illustration showing the bird (unfortunately back to us) and its nest is given opposite p. 160. A comparison with the illustration of a puesto, given opposite p. 70, in which a bread-oven

is seen to the left of the house, will explain the name "oven-bird."

This bird is of about the size of a blackbird, and has, like it, a rather long tail. Above, the colour is mainly of a warm reddish-brown (a common colour in Argentine birds); below, a buff or brownish white (also a common colour). In some places, especially in the upper tail-coverts, there is a "red" like that of a red-start; one could imitate it by mixing a little vermilion with sepia.

The commonest note is a sort of chattering phrase into which the bird throws extraordinary energy or even passion, the whole body trembling and the wings drooping and quivering towards the end. It begins with the "bick-bick" of a suspicious blackbird, and then it runs on with a quickening chatter, the bird stooping like a man shouting his hardest. The sound is noise, not music; and, as with the teru, one gets very tired of so much fuss about nothing.

The nests are of mud; and in all cases you turn to the left after entering, in order to get to the inner sanctum where the eggs are. These birds have a mania for building, in season and out of it; they cannot resist the temptation of good mud. And they build anywhere! One built on the top bar of the drive gate. That nest was soon shaken off. It then built on the post; and *that* was jarred off also. They had nests in September, when I arrived; and in March (autumn) a pair built one on a cross-bar of

the home windmill—and left it alone as soon as it was completed.

The Casereta.

In many of the small trees near the house and in the monte one saw big nests, like magpie's nests, but of finer twigs. These belonged to the casereta—a quiet little bird, of about the size of a yellowhammer, which was of a light buff colour below, and of a darker colour (not uniform, but streaked or spattered) above. It seemed very small to make such a nest.

Its note is curious. Probably few of my readers have ever let fall a steel ball, such as is used in the ball-bearings of a bicycle, on to a solid glass slab? It goes ping——-ping——ping—-ping—ping-ping-ping, &c., quickening up in a hurried way. The quiet little phrase of the casereta is like this; a servant used to call it the "chatter-bird." The entrance to the nest is at the side; and my brother told me that it was difficult to find the way in with the hand.

I myself disturbed no nests; merely made such observations as a pure spectator could make. It was of little use examining any empty nests; for the intrusive sparrows might have been before me. I could never feel sure that an empty nest had remained as its rightful owner had left it.

The Brasa de Fuego (*Live Coal of Fire*).

For brilliance, nothing approached the brasa de fuego. This was a distinctly smaller bird than the

pechicolorado, being of the size of a large tit, or of a goldfinch. It was of a resplendent crimson all underneath, and the head was mainly crimson too; above, it was black, and a thin line of black came horizontally across the eye. When it flew, more of the crimson was displayed. In the sun, one might almost say, it flashed "like a jewel," or like crimson enamel.

The nest was ludicrously small. One that I measured was 3 inches across outside and 1½ inches across inside, at the top. It appeared to rely entirely on protective mimicry for concealment. For the nests were built without shelter in the main forks of small trees, some four or five feet from the ground. [I speak from experience with some five or six nests found in the monte.] They were always of brown twigs and gray-green lichen. Whereas the adult birds were brilliant as described, the young birds were clothed with brownish, hair-like down, having gray-green "splashes" all over it, and they looked like part of the nest, as the nest looked like part of the tree. There were, as far as I saw, only three eggs; and in one case, where one of the eggs was bad, the two small birds filled the nest to overflowing. I had told my sister-in-law of this curious mimicry and had brought her to see this nest. She looked down on it from a distance of about two feet, and said, "But where are the young birds?" The disguise must have been very good, for she came prepared for mimicry and yet was deceived.

The Swallow Race.

About the house there were a number of the birds which I take to be Sclater and Hudson's "domestic martin." They were 7½ inches long, and 1 foot 3½ inches across the wings. The colour was blue-black above and white underneath; but the whole of the head appeared to be black. The flight was stronger than that of our swallow, but not so strong as that of the swift; they had short forked tails like our house-martin. The nests were not hanging; they were built *on* beams under the eaves and appeared to be of hay banked up with mud outside. The bird looked about the size of our swift, but had not the same appearance—did not look as though built specially to be a perfect flying machine.

There was also about the house, and out in the camp, a bird smaller than a martin and evidently of the swallow or martin race. It was brownish black above and white underneath, the white invading the face. It appeared to build in holes in banks or in crannies in the sides of the brick-lined wells, and may have been the above writers' "bank-swallow."

Various Other Birds.

Many other birds, too, there were. The queer untidy *jays* (I think called by some *perinchos*), who never brushed their hair, and who always forgot to put on their tail-coverts, so that one had a general

impression of seeing the roots of the big feathers exposed; the dear little *dove*, smaller than a thrush, very gentle, very tame, and with a surprisingly strong coo; the valiant little *tijereta*, with its remarkable tail that opens and shuts like a long pair of scissors (whence the name), that would chase from its nest the relatively huge chemango when this approached too near; the "starling," as my brother named it (called more properly the *cow-bird*, I believe), that lays eggs in other birds' nests, especially in the poor little tijereta's; and many others.

It was very noticeable to me how, in the twenty years, various species had found out this island of trees in the treeless plains and had domesticated themselves there.

One interesting bird was the *cardinal*, a bird of about the size of a sparrow (or a trifle larger?) with a scarlet face, crest, and shirt-front. The back was a cold brown (brown with black, not red, in it). Underneath it was of a dirty white; and this white came round in a sort of collar that was very narrow behind the crest.

These birds are very common in Entre Rios (a warmer climate), and my brother had introduced a pair here. But, so far, they had not learned where to build. A cat destroyed one nest; another was on too slender a branch, and the wind (stronger here than in their native land) tossed the eggs out. In their fourth nest of the season they at last reared three young ones.

CHAPTER IX

SOME NOTES ON A FEW ARGENTINE BEASTS, REPTILES, AND INSECTS

Armadillos.

Of the strange armoured mammals whose gigantic cases I saw in the Museum at La Plata, there remain but very small modern representatives. In the Argentine, as far as I know, four species occur; at any rate, my brother, in his forty years of observation in the more temperate regions, had seen no others. At Santa Isabel I saw only one sort, the *peludo* ("hairy"); I saw these alive several times, and their holes were all over the camp: in fact, they are a great nuisance. One fine specimen I photographed and measured. Its total length, from the tip of the nose to the tip of the tail, was 52·5 cm. (or 20·6 inches); or, if the curves were followed, 58·0 cm. (or 22·8 inches). The length of the tail alone was 15 cm. (5·9 inches; and the length of the head from the back of the forehead-plate to the tip of the nose 10·75 cm. (4·24 inches). The greatest breadth of its armour, measured round the curve, was 30·5 cm. (12·0 inches). This armour, of a hard

horny material, looked jointed throughout; but as a matter of fact the front and back parts were practically rigid, while, between, came eight bands connected by "leather" joints. Thus its body had considerable flexibility. All along the edge of the armour was a sort of horny claws, ends of the armour-bands, pointing backward; and these would make it more difficult to pull the animal backward out of a hole. On both fore and hind feet it had five claws, those on the fore feet being the more powerful; the centre one of these was the longest and showed 2·5 cm. (1 inch) of bare horn. Coarse hair grew from between the armour bands. Its nose was soft like a dog's, but rather firmer.

The peludo eats grubs and the like, and is accused of eating carrion. It is nocturnal mainly, I was told; and certainly I, who did not go out at night, saw it mostly in the evenings. But it comes out also in the daytime, though it appeared to me to be then a little confused and blundering in its efforts to escape back to its hole. It is not flexible enough to roll itself up; and a good-sized dog easily gets hold of the edge of its shell and crunches it up like a biscuit. To my mind it is horribly fat and rich to eat—I could not stand it.

In the sandy province of San Luis the common armadillo was a very small one of the peludo type called the *piche*. When I visited an estancia in the province of Buenos Aires I found the *mulita* ("little mule," so named because of its long ears)

as well as the peludo, and I measured and photographed a good-sized specimen. In this the tota length, measured along the curved surface, was 46·0 cm. (18·1 inches), the tail 16·0 cm. (6·3 inches), the body 21·5 cm. (8·5 inches), and the head 8·5 cm. (3·3 inches).

The main differences between it and the peludo were that—

(i.) The ears were much longer, the head tapered more to a point at the nose, and the protection to the head was more uniform and had not the form of a forehead-plate.

(ii.) The front and back parts of the armour were really solid, and showed no division into bands. There were six bands in the middle part connected by "leather" joints.

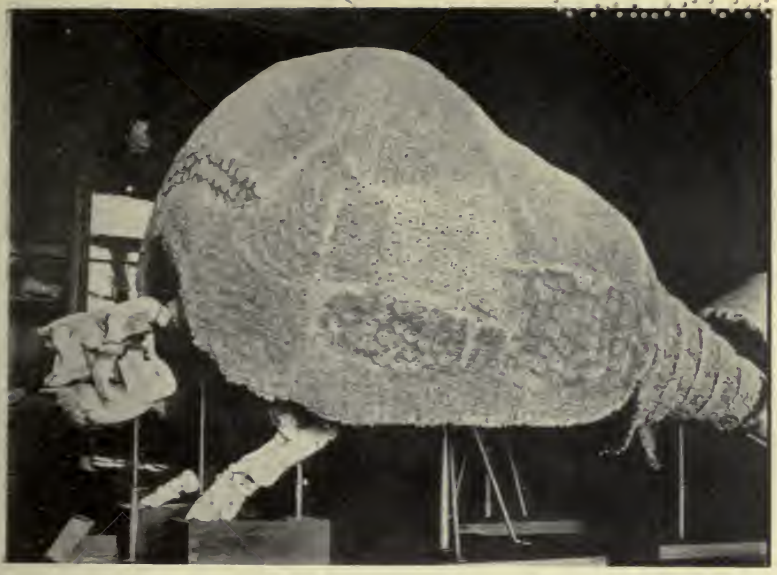
(iii.) The front armour had projecting cheeks, and the mulita could tuck its head in between them, so that, as regards getting really inside its armour, it lay between the peludo and the mataco (to be mentioned presently).

(iv.) On the fore feet were four claws only, the two central ones being the biggest. On the hind feet, five claws.

(v.) It was not hairy.

I was told that it does not eat carrion, and that natives will not use the peludo as food, but will eat the mulita.

It is a funny little beast, quaint in its deportment; and it is of the mulita's "shell" that those curious



PREHISTORIC ARMADILLO, 12 FEET LONG.

THE MULITA, ONE OF THE EXISTING SPECIES, 18 INCHES LONG.

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work-baskets are made that travellers so often bring back from Rio or Buenos Aires.

A fourth kind of armadillo that my brother knew was the so-called *mataco*. This can roll itself up completely into the ball-form, and is the only one of the four that can baffle completely the attacks of dogs.

There is a good specimen, I believe, in the Dead-letter Office, or in the Post Office "Museum of Curiosities." At any rate, years ago, we despatched one that my brother had sent home (cleaned and stuffed) to the Museum at Oxford, and it never got there. I suppose that covering and address had slipped off the rounded surface of the specimen.

Hares.

In the districts that my brother has known, viz., the provinces of Santa Fé, Entre Rios, and Cordoba, the old native or "Patagonian" hare was never common, and it is now either extinct or nearly so. But, some time ago, some intelligent (!) person introduced what is called "the European hare"—from Germany, I was told. To me they looked like English hares, only with rather longer tails. An English sportsman told my brother—

(i.) That he had shot 6,000 (six thousand) hares out here between May and September in one year [I could see that they were a regular pest];

(ii.) That they are the same animal as the English hare;

(iii.) That in the young female he had found *one* young one, four or five usually in the mature female, and as many as seven in some.

I noticed that when they ran away and paused to reconnoitre, they not only sat up, but stood right up on their hind legs. It was curious to see them stagger sometimes, losing balance.

All over the camp there are not only armadillo holes, but also shallow excavations made by these animals when searching for food. These the hares use with great skill for concealment; the hindquarters are sunk in the deeper part, while at the shallower end lies the head with the ears flattened down, the animal thus being able to watch its enemies. Thus lying, it cannot be seen easily even on bare ground, and it is ready to be off at once. My own belief is that the hares "improve" these holes, and I should not be surprised if, in time, they learned to burrow. They do (I am told) sometimes take to earth in viscacha or peludo holes.

Miscellaneous Mammals.

I came across various other animals, but did not see much of them. There was a marsupial called the *comedreja* (for which, however, the dictionary gives "weasel"), which has a prehensile tail; my brother knew it well. There were the *viscachas*, which, I believe, are like the North American "prairie-dog," but are decidedly larger, whose holes are such a nuisance, and which, now that there are the embank-

ments of Australian tanks to be protected, are being killed out with carbon di-sulphide. There were *hurons*, like large weasels ; *foxes*, too—I saw a gray sort with a very triangular face ; and *skunks*, a great nuisance when they come about a house.

The Iguana.

Turning to reptiles, the most interesting was certainly the big lizard called the iguana.

My brother brought in a large one, one day, and I photographed and measured it. The total length was 1·22 metres (4 feet), the tail 0·78 metre (2 feet 6·7 inches). When it breaks its tail off, the break occurs a little way down it, not at the root, the breaking-place being indicated by a sudden change which there occurs in the nature of the scale-covering. My brother has made notes about this creature at various times since 1868, and here are some of them.

"(i.) It lays its eggs in holes." [Not always, as will be seen later.] "The entrance to the hole is small and neatly lined around with dry grass. At the end of a yard or so is the chamber, which is completely stuffed with grass, in the midst of which are the eggs stowed away, the whole being damp and warm. They lay in November and December, and up to forty-seven eggs. The eggs are like soft white pigeon's eggs.

"(ii.) When attacked by dogs, this creature raises himself on his hind legs, and, with the support of his tail, rushes at his adversary. When found in camp they seldom take to flight, but manage by short stages

to regain their holes, attacking the intruder in the intervals."

[*Remark.*—In 1889 I saw one attacked by big dogs. It faced them for a little time, and then dropped its tail. This remained jumping about, and the younger dog was attracted by it and stayed behind. The older dog pursued the majority of the animal, which was trying to regain its hole. To continue the notes.]

"(iii.) Sometimes also they take to the water, and, although watched narrowly for a long time in a small laguna that was free of reeds, have not appeared again.

"(iv.) When hens' or other eggs are fresh enough, the iguana makes a hole in the end and cleans out the interior with his long forked tongue. His chief food is flies and beetles; but he feeds greedily on the eggs of the plover." [I think the *teru-tero* is here meant.] "One thus engaged would not leave off lapping an egg that he had broken until nearly trodden on, and had disregarded the swooping and screaming of the parent birds. In the stomach of one was found a cat-fish 6 inches long, and four eggs of the common coot, one broken and three entire, all of which were sat.

"(v.) When the tail has been cast, they grow another stumpy one again, but never a good one."

So run, in substance, these old notes.[1]

[1] Though I have, for the sake of distinguishing these notes from my own observations, used inverted commas, I should say that I have not quoted *verbatim* from my brother's old records.

OVEN-BIRD AND ITS MUD NEST.

HEAD OF A 4-FT. LONG IGUANA.

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On January 30, 1909, my brother noticed, in the midst of what had been (before the locusts came and ate everything) a dense growth of big thistles, a heap of dry vegetation. Suspecting that this concealed the remains of a sheep killed by thieves, he got down and kicked up the heap, which was 3 or 4 feet across. It was a mass of rotted stalks, &c., all warm and damp and caked together. A large iguana ran out, and inside he found concealed some fifty eggs and baby iguanas together. A perfect egg (which was flexible, though fairly stiff) was 4·25 cm. (1·67 inches) long, and 2·8 cm. (1·10 inches) in its greatest diameter.

A young iguana, judged to be recently hatched, was 21·5 cm. (8·45 inches) long, and of this the tail took up 13·5 cm. (5·3 inches). The young ones had a lot of vivid green about them, and their feet seemed very slender (in proportion) as compared with those of the old iguana.

The Escuerzo.[1]

Nature is not always serious, and she certainly made a joke when she devised the "escuerzo." It is a toad of most remarkable colouring—(above, mainly a vivid grass-green and various browns)—and marking; and when angry—that is, whenever it meets any one—it growls and barks and blows itself out with air. It bites, too, if you encourage it, having the wherewithal to do this very effectively. When it squats, the tail

[1] Strictly speaking, I believe the word *escuerzo* means any kind of toad.

part gets tucked in underneath, and its upper surface is then nearly circular. In a specimen examined, the length in this position was 4 inches; but this was not its true length, since its tail end was sunk in as mentioned. Its breadth depended on its temper: the two increased together, though I cannot say by what law. When merely ruffled it measured $3\frac{1}{2}$ inches across. The jaws are hard and bony, and the upper jaw has small teeth in it. I read that the lower jaw is a mere bony ridge: I did not examine this, as I neither wanted to worry my animal overmuch, or hurt it, nor to get bitten. The arc of the jaws measured about $3\frac{1}{4}$ inches; it had a huge mouth.

The eyes stand up, when open, and look forward much like the windows of a built-out attic-window on a sloping roof, the roof of the window being represented by a sort of lid of skin. When it closes its eyes they sink down and the lid sinks too; so the eyes are only prominent when it has them open.

The particular specimen that I examined had become dispirited, and would not bark nor bite when in captivity. I set it free on the monte drive, and gently urged it with my toe towards the wilderness of weeds to one side. It then recovered its usual spirits somewhat. It blew its body out, the hind part chiefly, as a man blows his cheeks out, so that it looked like a distended bladder and the sun shone through its skin. [The air appeared to be introduced under the outer skin.] At the same time it lowered its head, crouching on its arms and raising the hind

THE ESCUERZO.

A TARANTULA, PINNED OUT, FROM UNDERNEATH.

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part of its body, and growled and uttered a kind of hoarse bark. But it did not bite my toe nor a stick that I brought under its notice; it blustered only.

Needless to say that, being a toad, it has a great reputation for having a poisonous bite. I found that natives had a great horror of even a common toad; and certainly this escuerzo *is* alarming.

My brother told me that the plough sometimes turns one up. The only one that I found was in a marshy place. In July, 1898, the capataz discovered the cranium of an escuerzo entangled in the wool on a sheep's back; the creature appeared to have bitten into the wool and to have been unable to let go. This cranium had been kept, and I photographed it; the small teeth in the upper jaw were visible. I measured the jaw round and it was $3\frac{3}{8}$ inches; a close agreement with the measure of $3\frac{1}{4}$ inches that I had taken from the living animal earlier.

Of common big toads I found plenty in the garden.

The Vibora de la Cruz.

Snakes are but seldom in evidence in the Pampas, and the only poisonous sort that one sees usually is the "vibora de la cruz" ("viper of the cross," from the marking on its head). In a long visit in 1888–9, I think I saw only two of these and one harmless snake; in this still longer visit of 1908–9, I saw no snake at all save a vibora de la cruz that my brother had killed and brought in for me to inspect.

In 1889 I noticed a curious habit that these snakes

have of rattling the end of the tail against the grass with a very rapid vibratory movement.

Here are two notes made earlier by my brother :—

"(i.) A large vibora de la cruz that I killed had in it seven perfectly formed young ones, each coiled round in a separate bag. On liberating these, they each and all rattled their tails" [*i.e.*, against the grass —for they have no rattles in the tail] "and flew at a stick presented to them just as the old ones do.

"(ii.) Vibora de la cruz killed at Santa Isabel on May 4, 1903 ; length, 116 cm. (or 45·6 inches) ; girth, 14 cm. (or 5½ inches) ; liver, 18 cm. (7·1 inches) long. It had in it 18 eggs, each 2·2 cm. (0·865 inch) long, rather larger than a robin's egg. The heart was the same size as the eggs. In the stomach were two rats. It had four fangs in the upper jaw, and the lower jaw-bone ended with two sharp fangs." [*Remark.*—I have the skin of this one, at Oxford.] So run the notes.

On the whole, snakes in the Argentine do not count as a danger.

The Tarantula.

[See figure opposite p. 162]. Mankind, puzzled with "things as they are," has always had a tendency toward shifting the responsibility for the existence of moral evil on to an Evil Power that has for a time licence to work his will. I, for my part, should like to be able to ascribe to him the creation of such creatures as the octopus and the tarantula. Anything more repulsive, wicked-seeming, and in-

human, anything more terrible than this last, were its size only increased, I cannot imagine. It is, perhaps, the presence of all that makes for destruction by poisoning, piercing, and rending, and the absence of anything that suggests qualities that we understand, that makes this huge spider so abhorrent to us. For one thing, it has nothing that one can call a head! Even a locust has a countenance, though impassive and sphinx-like. But the tarantula, where one looks for a head, has only the upper bend of two terrible curved talons or falces; the eyes are set on a watch-tower on what a layman would call the thorax; and the mouth is a mysterious, ravenous hole underneath, into which the falces fiercely thrust the prey.

In the specimen that I measured, of the four pair of walking-legs, the front and back pair were $2\frac{1}{2}$ inches long each. And when killed and pinned out with legs somewhat bent, the straddle was about $4\frac{1}{2}$ inches. The feet of these walking-legs were elongated pads with small claws at the end. Clearly they were not used for tearing, but a pair or two (and the creature has plenty) might be used for holding prey; indeed, it often stands up on the two hind pair and elevates the other two pair threateningly. It climbed up inside an inverted glass tumbler, but only with the help of side-pressure, straddling across. Besides these four pair of legs were a pair of shorter "arms" that ended with what looked like poison-sacs and slender curved claws or needles. [In calling these

"arms," I am (as always) speaking as a layman entirely ignorant of the science side of natural history.] What looked like the head proved, as I have said already, to be the upper bend of two powerful falces whose points normally curved into the maw underneath. I could not straighten these out; but, by using force, bent them enough to show up when I photographed the creature from underneath. The bared talons at the ends of these were of black horny material and were $\frac{9}{32}$ to $\frac{10}{32}$ (more than $\frac{1}{4}$) inch long. [Finding that I had room for but one figure of the tarantula, I chose, for reproduction, this photo in which the falces are seen, the creature being viewed from underneath. As I write these words I do not know how the reproduction will turn out; but I hope that the sacs and needles at the ends of the "arms" will show up clearly as in the photo.] I imagine that these falces are used to grip and pierce, and the arms with the poison-sacs to poison, the prey. One that I had killed with ammonia had gathered up the cotton-wool that had been soaked in the liquid, and thrust it against its maw with these falces.

I killed another spider of about the same size; it was fatter and heavier, of rather less straddle, and had no sacs and needles on its "arms." Was it the female tarantula? I do not know.

I regret to say that I did not come across a *very* remarkable spider described by Mr. Hudson in his "Naturalist in La Plata" (ed. 1892, p. 193). This creature chased Mr. Hudson when he was "riding at

an easy trot," and ran up the lash of his whip when he slashed at it. A subject for a nightmare, indeed!

The Praying Mantis.

There are various mantises out here, of water and of land, and all are very "weird."

But the commonest and most amusing—it is a relief to turn to it after dealing with the tarantula!—is the praying mantis.

The female (as I took it to be) had only rudimentary wings, and was the fatter and larger; 3 inches long was a good size. The male had wings and flew: it ran from $2\frac{1}{8}$ to $2\frac{1}{2}$ inches long. Both male and female might be brown or green; but there was always a line of white spots down the back.

These are the only insects with which I am acquainted that turn their heads about and appear definitely to look at things,[1] and that with both eyes, as a dog does. Indeed, they looked as though they were on a level with the higher animals as regards observing things, feeling curiosity, getting alarmed, or becoming bored.

One, to judge from appearances, learned a great deal about the paraffin lamp, and noticed the connection between the turning of the milled head and the increase of brightness in the lamp.

Their ways and attitudes are funny beyond words! I have seen one throw itself back in alarm with its arms raised above its head, like a servant-girl who meets a

[1] See illustration. But the antennæ are really quite long.

toad; or again (apparently) bite its thumb, or scratch its head, or rub its nose.

The fore arms (held up in the air in a *praying* position, usually) are very powerful; one can feel their grip.

I saw a male, 2⅛ inches long, seize a vigorous saltona locust (in its last stage), a specimen about 1½ inches long and very strong, and begin to eat it alive. It became evident then that the make of the mantis was of great use to it. The powerful arms gave the requisite grip, and the long, hard neck (or thorax) put the delicate wings out of reach of the locust's struggling hind legs.

The Bicho de Canasta.

One of the first things that I noticed when I reached Santa Isabel and walked up the main path of the monte was the prevalence of small objects, evidently cocoons, hanging from the twigs of the sauces and acacias; there seemed to be a regular plague of them. This was at the end of September. It was much later that I witnessed the earlier stages in the history of these, and then I learned some more facts from Mr. Stuart Pennington, of Buenos Aires, which my own observations on the whole confirmed. Here is the story of the makers of these cocoons.

There is a caterpillar with strong jaws and front legs, but with very ill-developed "false" hind legs. This, from the very beginning, makes to itself a house of twigs and leaves; and it enlarges its house as it itself

FEMALE PRAYING-MANTIS.

BICHO DE CANASTA, HOUSE, AND COCOON.

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grows larger. Further, while the earlier houses are more irregular in form and made mainly of leaves, the later houses are more regular in form and built up mainly of twigs.

This caterpillar is called the "bicho de canasta," or "basket-caterpillar," the word "bicho," however, being applied in a very general way not only to grubs, insects, and suchlike, but even to such quadrupeds as we in England call "vermin."

These houses are lined with silk of an extraordinary strength and toughness; in fact, though you can crush a house or cocoon, you cannot open it by tearing, but must cut it open with very sharp scissors. While the creatures, when smaller, wander about with their little houses over the backs of leaves, the older and larger ones, with heavier houses, when they intend to eat, always anchor their houses firmly by means of silk to a leaf-rib or twig. They then put out their heads and a part of their bodies and eat with extraordinary rapidity. When alarmed, they withdraw into their houses and close the opening very tightly. At all stages they can and do let themselves down (again by means of silk), house and all, from any height, and they can and do climb trees, dragging their houses.

When I cut off the twigs on which they were anchored and laid them on a table, the small ones soon unanchored themselves and began to drag their houses about the table, but the big ones took perhaps half an hour or an hour to get free, moving their heads about much in the meantime. In one case I left in my

dark-room a large one [it was the very one shown in the illustration], whose house had much leaf on it in the lower part, anchored to a twig. Next day I found the bicho with its house on the far side of the room, and all the leaf had disappeared, leaving the lower part of the house a smooth brown tube, as it is in the cocoon form. [See illustration opposite p. 168.]

When the bicho is about to turn into a chrysalis it anchors itself very firmly to a small twig. And so tough is the silk that the twig in growing cannot stretch it. At the place of fastening such a twig shows a thickening, and on breaking it here one finds a flattened disc of silk with the original small hole in the middle. The twig has thickened on each side of the ligature, but has not been able to stretch it. This throttling of the twigs must injure the trees much. Outside, the cocoon is covered more or less with a very flimsy and not tough coating of silk. To do this I think the bicho must come out at night. Mr. Stuart Pennington says (I condense what he told me) that the male is an inconspicuous grayish-brown moth with feathery antennæ.[1] The female undergoes the final transformation in the "basket," which she never leaves. She is a legless, almost organless insect with only a very few tufts of feathers scattered about her

[1] I have read that all male moths that have to hunt up and discover non-flying females have feathery antennæ and that they discover them even when hidden. These feathery antennæ, *if we speak in terms of senses known to us*, would appear to be in some sense organs of scent.

body. Fertilisation takes place while she is in the basket, the male finding her out in her concealment. The female on impregnation throws off all useless organs. Hence it is that all that is found in the baskets of the females is a mass of eggs and the débris of a body.

To such effect wrote Mr. Pennington to me.

I myself, in September, 1908, observed always two sorts of cocoons. One was longer and ended in a more definite tube; this was empty and the husk of the chrysalis was in the mouth; the moth (the male, it would seem) had escaped. The other was plumper. In this latter I found always a perfect chrysalis shell (as it seemed) filled with a curious woolly stuff that hardly looked like eggs. Perhaps, however, this stuff was the remains of eggs already hatched. But the chrysalis shell was apparently unbroken, or at any rate could not be described (to quote Mr. Pennington) as the "débris of a body."

I leave it "at that." Only I must confess that, had Mr. Pennington not given me the above history, I should have guessed that these chrysalis shells filled with woolly stuff represented victims of the larvæ of one of those parasitic flies that lay their eggs in the living caterpillar.

I may mention that in autumn (March), when I was in a camp-town for the night, I noticed that each electric light in the open patio attracted crowds of moths that corresponded to Mr. Pennington's description of the male of the bicho de canasta.

The numbers of these houses and cocoons on the trees passes belief. I was told that when there is no locust invasion, whose ravages swamp those of this bicho, children are sometimes set to collect this latter and are paid by the number of *kilograms* collected!

I will now add an observation that I made. When I was there the locust plague was, as I have already said, of extraordinary severity. The big saltonas even attacked the twig-and-silk houses of the bichos de canasta, and they certainly left the bicho itself no food to eat. I noticed multitudes of these, in every stage of development, emigrating to dead trees and attaching themselves there, though most were not nearly mature and needed more food.

Later on (in May) these dead trees were covered with houses, very few of full size and many quite small, the inhabitants of which had, in general, died; and but few were covered with the regulation outer coat of silk.

It seemed evident to me that the locusts had been too much for the bichos de canasta and had driven them prematurely from their food. And this strengthened in me a suspicion that this curious creature is a case of the "survival of the fittest." Certainly, seeing that locusts eat each other, a caterpillar with a house would be the one most likely to escape when a locust plague came, unless, indeed, there were other kinds that the locusts will not eat, as they will not eat paraiso leaves. Again, can even birds extract the bicho from its house? I required sharp scissors.

A Curious Bee's Nest.

One day I was given two curious sticks or tubes made of dry but still green-coloured leaves. What appeared to be a complete one was 3½ inches long and about half an inch in diameter. It was made of leaves rolled into the form of truncated cones and fitted one into the other. I stuck it on to a card and sliced the upper side longitudinally until the inside came to light (a sharp razor did this without breaking off much of the leaf-work) and the secret of the thing was revealed, as also the construction. It was clearly, as my brother had already told me, a bee's nest. There were seven cells separated by neat partitions made of many thicknesses of leaf. Each cell was lined with wax and contained a grub and what looked like bee bread. I did not see the bee that makes this nest, but took it on trust, as my brother knew about the whole thing.

Wasps' Nests.

At one time there were to be seen busily and swiftly glancing about over the hard and sun-baked ground large wasps. These appeared to be somewhat extensible in body and could reach to a length of one inch, and were yellow and black, with head and eyes red. They dug holes, and in digging they used the front legs and sent the earth flying between their hind legs, as does a dog. When issuing from a hole they first pulled bits of earth down into it, grasping the lumps and walking backward down into

the hole, and then went outside, turned their back to it, and sent earth flying between their hind legs into it again.

I was not quite satisfied with the evidence that I collected from personal observation, but believe that (1) they close the hole very often when leaving it before all is finished, reopening it on their return; (2) when all is finished there remains buried one egg and a number of dead or paralysed flies and other insects.

I also found (and photographed) nests of mud made (in any form) in the folds of an old sack. These were empty, but my brother had the following note about them, made years before.

"These insects" (wasps) "make cells of mud in which to deposit their offspring. After each cell is finished, it is filled with dead" (paralysed?) "spiders of all sizes. In one I counted twenty-six, in another only ten." [Clearly a single cell is here referred to.] "On the top of these the egg is laid, and the whole closed with mud." And so on. The nest reminded me of those neat little nests made of wood-paper that one finds so often in Switzerland attached to the under-side of rocks; but it was much larger and quite irregular in form.

Miscellaneous Insects, &c.

I came across various fine *moths*. One was large, 7 inches across the wings, and nearly black, but with beautiful markings. In 1888 I

noticed that it appeared to feed on rotten peaches.

Another, of the same appearance as a "humming-bird hawk-moth," only with a pointed tail, was 1¾ inches long in the body and 3⅞ inches across the wings. Its enormous eyes indicated night habits. For what nocturnal flower did it need a proboscis 3⅝ inches long?—for that was the length. Another magnificent moth, when its wings were closed so that the under-wings were invisible, was of a lovely green with a row of white spots down the side; the tail was very pointed, and the thorax and head gave a bold curve. The under-wings were of green, white, red, blue, and black; quiet in tone, however.

The first and last of the above three I saw living, and was much struck with the dull red glow of the huge eyes when the insects were in a dark corner of a dimly lighted room.

The *fireflies* were a pretty sight, and one could see them even against a fairly-luminous late evening sky. They were little beetles about 1·15 cm. (·45 inch) long. The light came from two bands underneath near the tail; and I concluded that the fitfulness of the light was only a matter of this part of the body being in sight or out of sight. I found no fitfulness in captured specimens.

Of *scorpions* I saw but one all the time, and that was only 1⅝ inches long. It was very soft and transparent while living; and I do not know how large these creatures grow in Argentina, nor whether

they are harder and more opaque when of full size.

Ants.

All the ants that I noticed were of the leaf-cutting kinds. They were a great nuisance, as they would entirely strip the leaves from the little montes of willow (sauce) planted round the windmills.

The nests were underground, and converging to the openings were a system of branching paths, like main rivers and their tributaries, even 20 yards long, quite bared of vegetation.

The loads carried were often absurdly big and unwieldy.

Like Mark Twain, I have my suspicions as to the intelligence of ants. For example, I set one that was returning, laden, to the nest, going in the wrong direction. It persisted in its perverse course for 8 yards; meeting laden ants, overtaken by empty-handed ants, jostling against the laden current, falling often. At last, as it seemed to me, it happened to get up right way round, and, without any muttered comments on its own stupidity (or on mine) went home again. I dug a pitfall in a path. It would have been easy for the ants to have gone round it; but they fell into it until it was levelled up with the leaves and their carriers. Then the stream passed over the top of all.

Who is it that has pointed out the curse that socialism has been to ants and bees and such-like?

—how it has killed all progress; a stereotyped and elementary civilisation? A community of bees may be, *quâ* community, superior to a community of dogs. But, as a companion, a tame bee or a tame dog? One can, for the purpose, assume the bee to have suitable dimensions. I am sure that its stupid lack of adaptability would be most annoying.

Mosquitos.

In 1888–9 I noticed a very remarkable fact concerning the mosquitos.

These insects abounded in the camp, and were there often very troublesome towards evening.

Yet one could sleep out in the veranda without being touched by one of them, though, over the garden fence only a few yards off, there were millions. Further, the garden was some 80 yards long, the 40 yards nearer the house being cared for and weeded, while the further part had run wild. If in the evening one walked down the path, one was attacked as soon as the weedy party was reached. But when one returned, the insects dropped off as the weed-free part was re-entered; and, by the time the veranda was reached, not one was left. Yet there was no smoke to account for this.

In 1908–9 I never slept out; but certainly mosquitos were not one of the troubles of life.

CHAPTER X

PLANT LIFE—WATER—METEOROLOGY

Trees.

In the vast flat alluvial plains that I visited in the provinces of Buenos Aires and Santa Fé, and that I passed through on my journey through Cordoba to the Andes, no trees grew naturally. As regards those that were planted, it appeared to me that there was a distinction to be made between the towns and the open plains; and I put down the difference to the lack of shelter from wind that there is in open "camp."

In the provinces of Buenos Aires and Santa Fé, as far as I am able to say—and perhaps I had better keep to the province of Santa Fé, and to a latitude of about 33° S.—one could plant round the estancias peach-trees, sauces, acacias, paraisos, a kind of poplar, pear-trees, and no doubt many others, all with very successful results; but the eucalyptus, palm-trees, and others did not thrive at all.

Quite close to us, in the more sheltered square of Melincué, the eucalyptus grew splendidly, and I saw in the gardens prickly-pears and other trees that

would not grow out at the estancia. And in the still more sheltered parks and gardens of Buenos Aires, which was rather further from the Equator, palms and other subtropical trees grew freely. In the case of Buenos Aires, the proximity of the sea may well have had something to do with it; but this consideration would not apply to Melincué. It appeared to me that in the open camp there was not only more wind, but also much harder frosts in autumn, winter, and spring than in the towns; but of this I am not sure.

Some Notes on Grasses.

The grass best known to English readers is the *Pampa-grass*. When I visited the country in 1888–9, while yet the camp near Santa Isabel was in its native state, there was usually a fringe of pampa-grass round the big lagunas. It appeared to me to be a water-loving grass; that is, it was found where the water was not far below the surface. Round the Melincué laguna it grew in big tussocks; and as I rode by such a tussock the plumes of grass would rise higher than my head. In 1908–9 the land close to the laguna was not alfalfa-sown, but left as it was; yet the pampa-grass had vanished. So, on my brother's camp in the province of San Luis, pampa-grass was very abundant some eight years ago, while in 1909 it seemed all stunted and dying out. Here the water, though somewhat sunk, was still fairly near the surface. On the whole, I am myself inclined

to put down the disappearance of pampa-grass to the sinking of the water-level which seems universal; but the very able manager of an estancia that I visited suggested another reason. He said that formerly, when all the pasture was coarse grass, the cattle would not touch the still coarser pampa-grass. Now, on the other hand, when the pasture is alfalfa, the cattle, he says, "go for" the pampa-grass occasionally as a change of diet, and thus keep it stunted.

A curious and troublesome grass about the camp of Santa Isabel was (in 1888) the *paja flechilla*. [*Paja* in Argentina is used not only of straw but also of coarse grass; and *flechilla* is the diminutive of *flecha*, an arrow.]

This has long seeds armed with very sharp points and barbs. My brother has found them in the livers and other organs of sheep; they are constructed to pierce and then work inward.

The *paja voladora* is remarkable. It is the name given to the long seed-bearing stems of *puna* and some other native grasses. These break off, and, in a wind, drift or roll in a curious way—quite bewildering to the eye—over the surface of the pampa. Such stems run up to 2 feet long. They used, in old days when the camp was covered with native grasses, to drift up against the fences; and sometimes in such masses that, in case of a prairie fire, the heaps of paja voladora collected round the posts would burn them up. I saw these heaps in 1888.

About December 16, 1888, a terrible occurrence took place in a railway-cutting between Candalaria and Guardía de la Esquina. A cutting was filled with this drifted grass. In the morning a train passed safely through it, though the grass caught fire. But in the afternoon, the cutting being again filled, the train returned *with the wind.* The drifted paja voladora caught fire again, and the flame ran with the train. In five minutes this was on fire; eight persons were so consumed that not even bones were found, and eighteen were nearly burnt to death—I cannot now say whether they survived. My brother saw one young man who had lost his hands and whose face was unrecognisable; and whether the above account be quite accurate or not, there is no doubt that the horror of that cutting, "like an oven," could hardly be exaggerated.

Of grasses in general on the natural camp the *puna* was the commonest about Santa Isabel; it was thin and wiry and grew in huge tufts, not unpicturesque. But I well remember great sheets of grass (*paja colorada*, I think) having a red seed; how wonderful it looked about sunset!

Weeds.

In old, pre-alfalfa days at Santa Isabel the chief weed worthy of notice (and weeds did not abound) was the poisonous *romerilla.* The "native" cattle and sheep seemed to know and avoid it; but imported stallions, bulls, and rams had and still have

to be taught not to eat it. They are tied up, and the weed is burned to windward of them, so that they are well smoked. Curiously enough this teaches them to dislike the green and living plant.

There was also some *stramonium* to be seen growing luxuriantly in an odd place or two; and my brother told me that he cured himself of asthma by smoking the dried leaves of it in a pipe. But I should say that on the whole, on the rich alluvial plains of dark soil, the native grasses had survived all other plants, as the "fittest." [In the sandy camps of San Luis, where by the way the water was near the surface, weeds of various kinds abounded, and, as it seemed to me, grasses were relatively scarce.]

At the present time, in the districts where the land is rich and has been ploughed up, and where crops and alfalfa have taken the place of the native grasses, all this is changed.

Weeds have suddenly sprung up in quite an appalling way. Take thistles alone. I do not know how many sorts there are *not—cardo negro*, *cardo blanco*, &c., and the worst of all is the *cardo castillo*. In the monte the cardo blanco rose well over my head; in some of the paddocks I could not make my way on foot through the cardo negro (I think it was), and in many parts you cannot ride or drive at all—the horses will not face the thistles.

In the ploughed land of the colonists I have seen another sort of weed growing as regularly and densely

as the lino—and that is saying much; and there was land near Melincué that seemed to have regular crops of weeds of other kinds again. Indeed I, in my ignorance, several times mistook weeds for crops. But the thistle plague is really a serious matter, especially (in my brother's opinion) as regards the cardo castillo; for the thistles often abound in and spoil the alfalfa pastures, while other weeds as a rule do not invade these. The locusts, by the way, appeared to eat the thistles first of all; but I fear they did not anticipate and hinder the seeding to a sufficient extent to diminish the plague for the next year (1910).

In this connection I may say that where the alfalfa had been eaten down close, so that the ground was nearly exposed, a native trefoil, which before (I imagine) was kept down by the tall native grasses, had spread wonderfully. In one paddock where the alfalfa had failed and the herbage was excessively short, this trefoil carpeted the ground. This is *not* a weed; it forms very good pasture.

Water.

When in the Andes I came across no water that was not saline. Even the glacier streams left some white crust on stones; and any springs that I saw issuing from the mountain-side were very salt and also deposited much lime. [See p. 207.]

In the province of San Luis, nearer the Andes than Santa Fé, the water was more saline than in

Santa Fé; on the beds of the lagunas that had dried up was left a thick white saline deposit, and the margins of decreasing lagunas showed a white saline rim. In both cases I speak of the ordinary lagunas whose water was potable for cattle. [See p. 282.]

In Santa Fé I had not in 1888–9 noticed the saline character of the wells, which then tapped only the "surface" water; but in 1908–9, when we used semi-artesian wells, this character was very marked. When such water was placed in a pan on a paraffin stove to keep the air humid, and evaporated, a very saline residue was left. Yet we drank it!

The large laguna near Melincué was exceedingly saline; quite undrinkable. Part of this laguna was usually dry; but I have reason to believe that a persistent wind in a suitable direction would flood this, and it would later be left dry again. Certain it is that sometimes the dry part would be crusted thickly with salt.

One day when a turbulent wind raised high into the air above Melincué and all the wide bare roads a cloud of brown dust, visible from a great distance, there was raised over this salt-crusted margin of the laguna a cloud that was visibly white—a cloud consisting mainly, I believe, of sodium chloride and sulphate; and this whitened the grass for some distance around.

Weather and Climate.

I can only speak of this, for certain, as regards the regions about Santa Isabel; but I believe that this

was typical of a very wide area, perhaps of all the Central Pampas.

In the spring, I found the mornings very fresh, or even very cold and frosty, and the days hardly too hot, well on into October or even somewhat later.

But, during some three months or so of summer, the heat of mid-day was certainly too much for a white man on foot, though I never heard of actual sunstroke. Even the peons of the gaucho class took a siesta; and a middle-aged Englishman, coming in for dinner at 11.30 a.m., would not care to face the sun again until after his 4 o'clock tea.

Shutters and closed windows were needed to keep the rooms cool; the air lying over the heated bare earth of the garden or patio (yard) got very hot indeed.

On horseback of course one could do more; but I noticed in 1888 that the peons (more gaucho then) wore handkerchiefs under their hats, and never exposed their arms in haymaking. Ironwork in the sun in summer became too hot to touch; and, in my wooden dark-room, water soon became so warm that the films would float off plates or papers in ten minutes.

In Valparaiso (about the same latitude, but kept cool by the Antarctic current) I heard it said, "*This* is a white man's climate; Argentina's (in summer) is not." Certainly I, on foot, found the plains far too hot in summer.

I must not, however, omit to speak once more of

the beauty and freshness of the mornings and evenings in the plains. Rarely, even in the heat of summer, was there an oppressive night, and each morning the sun arose over cool and dewy plains through the freshness of which it was a delight to ride. And still more perfect were the evenings ; indeed, long before the sun set there was a tinge of red in his rays that idealised everything. Squalid brick huts in the suburbs of the camp-towns, dusty roads, even hides hung on the fences, all assumed a glory that redeemed the heat and weariness of the day ; and the sun as he finally set flooded the shining surfaces of the parched grass with crimson—it was as a sea of colour.

I was very much surprised to find, as autumn advanced, how necessary warm winter clothes were. In May we had very hard frosts—even ice on the pails ; but at midday it was still hot.

I consider the plains damp in one sense, since mists at night were common ; and of course, where there are mists, frost feels very cold. But all was dry in the daytime under the splendid sun.

On the whole the climate, as I found it on both my visits, is wonderfully steady. You get very long periods of splendid sunny weather, broken only by thunderstorms and violent wind. I heard that August is the one cloudy and drizzling month. I quite understand how Anglo-Argentines in England pine for their glorious sun when they are shivering through our usual long, wet, cheerless winters.

Thunderstorms.

The season of my first visit to the Argentine, 1888–9, was very exceptional, and I was able to observe as many as twenty-seven thunderstorms. The trees round the house were low, and there were none elsewhere; and so, by getting up the ladder on to the roof of the "galpon," I could observe the whole horizon.

My observations confirmed my previous view that there is no evidence whatever in favour of the existence of "sheet-lightning," or "harmless summer lightning." When a mass of storm cloud appeared on the horizon it would be lit up at intervals by a glare; and people on the ground perceived only the general lighting up of the sky and called it "sheet lightning." As the mass came nearer, I, in my observatory, began to see the top of a spark as well as the glare. Then I saw more of the spark; and, at last, when the clouds were near enough, I began to hear thunder. Everything pointed to one kind of discharge, viz., the spark-discharge that makes the noise called "thunder"; but you cannot hear the noise as far as you can see the light, and you can see the clouds lighted up when the spark is below the horizon.

Further, numberless observations convinced me that if the cloud-veil between the observer and the spark were too thick, one saw a glare but not the spark.

As far as I could see, thunderstorms came with an upper current whose direction was contrary to the

lower wind. I have had my hat blown off *towards* an advancing thundercloud. This would at once suggest friction between two layers of air, the upper one, at any rate, laden with water-drops, as a cause of the difference of electric potential excited, and therefore the possibility of discharges in general taking place between these layers rather than between either and the earth; though I do not mean to imply that these last do not occur.

Observation on the whole confirmed this.

Santa Isabel covers some sixty square miles; and my brother used to compare notes with other estancieros whose estates marched with his and covered big areas also.

Now, in all these, the only elevated objects were the estancias (with their montes), cattle, puestos, and fences; and men reviewed the camp daily to search out dead animals and to inspect the fences.

Nevertheless, in these twenty-seven thunderstorms (and in one the lightning flashed for thirty-six hours!) apparently no fences were struck nor cattle injured, though in other years some such damage had occasionally been done. Does it seem probable that any considerable percentage of the flashes came to earth? I believe that most were aerial, between layer and layer of air laden with the water-drops that form the clouds.

In my photos branches, or tributaries, of a spark were noticeable. I take it that when a spark has "ionised" a path, and so prepared it, there are

lateral discharges down steep potential slopes into this path. But of course no photograph indicates the order of sequence.

Hailstorms.

Of the tremendous hailstorms that sometimes occur I had no personal experience; I saw nothing very unusual. But I noticed that all glass that was exposed had to be protected with wire netting; and I saw how hail had battered the white-plastered mud-house on the estate in San Luis. I was told of hail-stones as big as pigeons' eggs; and it can be imagined what damage these could do.

Wind.

With the storms there usually came most violent winds; sometimes of quite tornado-like violence. The rule was to close all windows and doors lest the roof (though it was a very solid affair) should be lifted off. A pause, and then a reversal of direction of the wind, was a common feature. I regret that I did not make exact observations.

Day-mirage; the Earth hot.

When the ground is heated and there is not too much wind, there is maintained a layer of hot air close to the ground that acts as a mirror. It is an irregular mirror, such as that of a slightly disturbed sheet of water, which, as we know, "draws out" the image of a lamp into a long waving line of light.

Much insight into the common day-mirage is given

by the use of a telescope or binoculars; indeed, the person who has not used them is not competent to dispute the statements of one who has.

As far as I could see, the horizon was not extended, but the hot-air layer, reflecting the sky, made this last seem to creep in like an estuary on the verge of the field of view; and the tongues of this seeming estuary, that lay between the spectator and higher objects on the horizon, reflected these also in an irregular way as would rippling water. Hence such elevated objects as the small trees round a puesto would have long trembling reflections that made them on the whole appear somewhat like palm-trees; the head of this palm-tree being the upper part of the tree, seen directly, and the trunk being the long, drawn-out, wavering reflection in the hot-air mirror that clung to the ground. Small patches of bare earth would give isolated mirrors like pools—patches, in fact, of reflected sky; and the bare dried-up part of the Melincué laguna would seem to be filled with a sheet of water, in which a horseman crossing it would appear to wade.

Quite small differences in elevation of the spectator would produce considerable changes in the appearance viewed; he could effect great changes by dismounting from his horse or even by stooping in his saddle.

Dawn-mirages; the Earth cold.

I was never in the plains in the latter part of June, or in July or August, when (for all I know) there may

sometimes be frosts that last on into the day. I was only there when the frost was dispelled not long after the sun rose. Hence, going by my own observations, I am calling this second class of mirage "*dawn-mirages*"; though, for all I know to the contrary, "*winter-mirages*" might be a better title.

With the earth chilled by frost I found, by means of binoculars, that the horizon was extended and that objects usually below the earth's edge were seen; and further, that there were repetitions of the horizon-line. [I refer to observations made at dawn.]

This became more evident as the light grew somewhat stronger and animals about the horizon-line could be distinguished. I noticed then that an animal on the horizon gave rise to repetitions in the form of erect images, often repeated more than once, above it; these erect repetitions having inverted images under them. Usually the animal and the erect image next above it were connected by a sort of column of broken image.

As the day advanced towards the actual rising of the sun, watery intervals began to creep in between the several horizon-lines; and one noticed more clearly that the aerial images often showed one objects that were even then out of sight beneath the lowest horizon-line. After sunrise, the last phenomenon that occurred before all became normal would be, as far as I could make out, various indistinct aerial images over parts of the horizon; and in these images were indications (waving and distorted) of

objects out of sight below the now clearly defined horizon-line, with trailing inverted images under them.

I sketched these phenomena in 1888–9, and used some of these drawings in a paper that I wrote for *Nature* when I returned to England later in 1889. In 1908–9 I had photographic apparatus, but found at once that no visible results could be obtained without a tele-photo lens—which I did not possess; the angular height subtended by all mirages being very small.

Of course, over a lake instead of a plain, the water being at dawn relatively warm and at midday relatively cool, the two classes of mirage described above are interchanged; the dawn-mirages are warm-layer phenomena and the day-mirages are cold-layer.

With this interchange, I found that sketches of mirage over the Lake of Geneva taken by Professor Forel, of Morges, agreed remarkably well with mine taken in Argentina.

I would add that the last I saw of the cold-layer mirage may have been *inverted* aerial images alone; but the sun had already much disturbed the air layers, making all very indistinct. At sea one would expect that one might have, in the daytime, cold-air layers not much disturbed; and this might account for the reported appearance of the inverted images of ships that were themselves below the true horizon. My wonder is that there is not more mirage at sea, and

that the horizon is so sharp and at its right distance. I suppose that the relatively equable temperature of the sea may be the cause. The sea does not as a rule—though a lake or still shallower pool may—get very hot nor very cold as compared with the general body of air above it; and so does not, as a rule, give rise to air-layers, clinging to its surface, that are sufficiently different in density from the air above to act like mirrors and to cause mirage. Of course, a frozen sea is a different affair; one would expect mirage over polar ice.

In conclusion, I would suggest that the marvellous accounts of mirages that are sometimes given would never have been written had the observers used binoculars. With them, a "palm-tree" is seen to be a bush or rock with a trembling line of reflection below it; buildings become sloping rocks, or other objects, made into a pattern by the adding of repetitions and reflections sloping contrary ways; water becomes the reflection of the sky. In fine, we only see in a mirage what there is to be reflected and refracted; non-existent cities and palm-trees may be relegated to the Arabian Nights.

CHAPTER XI

TO THE ANDES—FROM SANTA ISABEL TO PUENTE DEL INCA BY RAIL—ON MULES TO THE HEAD OF THE TUPUNGATO VALLEY—CAMPING THERE FOR A WEEK, WITH EXPLORATIONS ON FOOT

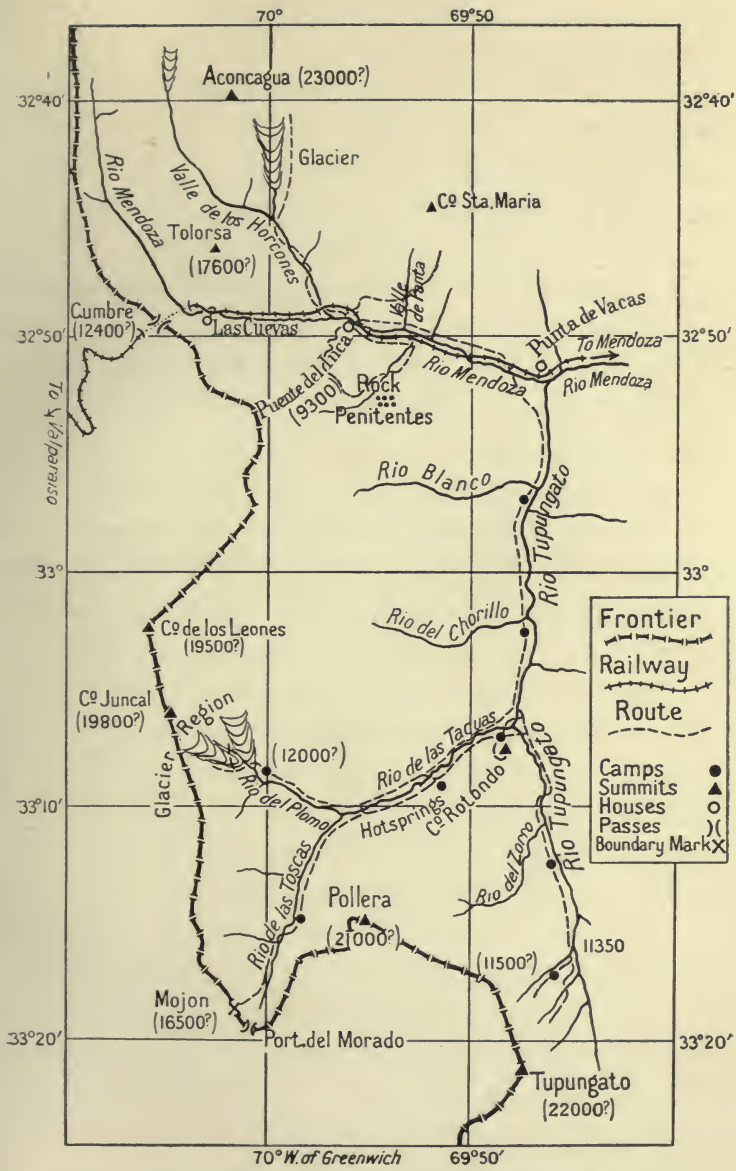
[*Note as to Maps and Compass-bearings.* — The accompanying sketch-map has been made on the basis of two sheets, dated 1898 and 1896–7 respectively, of the Chilian Frontier Commission ("Comision Chilena de los Limites"). The reader should *not* rely too much on it, but use it merely to get some idea of the direction of my wanderings.

Nor, I fear, can my compass-bearings be relied on save as roughly true.

When I went out to Argentina, I looked on an expedition into the Andes as an off-chance, and did not equip myself with any instruments. My pocket-compass had not been adjusted for southern dip, and so the card carrying the needle jammed somewhat on its pivot; hence I could not be sure that I had the true magnetic reading. Further, even assuming that the declination was 14° E. as given, I could not answer for there not being local magnetic disturbances. One series of springs witnessed to much iron in the rocks.

To avoid risk of confusion, I have, in this sketch-map, omitted the carriage-road which runs up the valley of the Mendoza and passes over the "Cumbre".]

On February 2, 1909, I actually found myself starting off on an expedition into the heart of the



SKETCH-MAP ILLUSTRATING THE EXPEDITION INTO THE ANDES.

To face p. 194.

Andes! I had learned that certain German and Swiss gentlemen, in the employment of Argentine Companies or of the Argentine Government, made a practice of taking their holidays in the mountains. Especially had I heard of Dr. Helbling (a mining engineer) and his friend Dr. Reichert (of the Mining Department of the Ministry of Agriculture). The former got up Aconcagua alone; the latter was driven back next day by that terrible enemy of climbers in the Andes, the wind, but later succeeded in climbing Pollera alone. Of the extraordinary cold-resisting powers, and I may say the very unusual carrying and staying powers, of these gentlemen I had heard enough to convince me that with my far less robust make *and* my twenty years' seniority I was no well-matched comrade for either. Still, when Dr. Helbling —to whom I had been mentioned by the guide, Abraham Müller, and by the doctor, both of Kandersteg—kindly asked me to join him, making the condition, usual I believe with these climbers, that we should be so far independent of each other that neither should keep the other back, I gladly caught at the chance of at least getting into the heart of this great and little-known mountain range.

How travelling had changed since my former visit! In 1888–9 my brother and I set off on a round of visits with a tropilla of some twelve riding-horses, a bell-mare, and the foal of this last. We drove the tropilla before us, changing mounts every four leagues, putting up at estancia after estancia by the way,

quite in the old style. We had then been able to carry with us only what we could stow away in small saddle-bags ; and once, I remember, we had to gallop hard to reach a homestead, seen as a wavering clump on the horizon, lest a coming *tormenta* (storm of wind and rain) should scatter our tropilla and leave us drenched on the plains, horseless but for the animals we rode. This old style of travel had its inconveniences ; but it was the real thing, and is one of the vanished (or vanishing) charms of Argentine life.

Now, I went by train from the near station of Villa Cañas to the junction Junin that lies on the "Buenos Aires al Pacifico" Railway, and there tried to take a ticket for Puenta del Inca, a station high up on the narrow-gauge trans-Andine railway on the Argentine side of the frontier and tunnel, since this was to be our starting-point.

At Junin I began to feel very much alone. I had had practically no opportunity of talking Spanish at the estancia ; and the characteristic (?) lack of obligingness of the smaller Argentine official made things more difficult. In answer to my demand for a ticket I got a very short answer, and the ticket clerk then became unaware of my continued existence. After more attempts I went back to the platform and tried a porter. He, no doubt with an eye to a tip—though there is little of even this interested politeness to be met with in this very Republican country—was somewhat clearer. The reading of a list of stations and fares made it, in the end, pretty plain that the clerk

had said (at express-speed) "No hay tarifa"; *i.e.*, "There is no tariff"; or "I cannot book you there." I had to take a ticket to Mendoza only, where the change of gauge occurs. There was supposed to be half an hour there for re-booking and re-registering luggage.

In the night there were some Chilian gentlemen in the sleeping compartment with me, and these were most cordial and helpful. They told me that Chilians were all friendly to the English, and that the naval officers all talked English. My own experience later led me to believe that both statements were true.

At Mendoza we arrived as the other train was starting; but my Chilian friends got hold of a "Villalonga" agent, and he—I gave him a tip of $5, not far from 10s.—somehow smuggled my luggage across; only I had no "guia" (or ticket) for it.

To go back to Junin.

I started from there at 12.30 p.m., and the train sailed away through plains, plains, plains. Always the same flat surface, always the same sharp circle of the horizon. Only at 7 p.m. or so did I notice a low sand-dune or two that somewhat broke the monotonous level.

We reached Mendoza at 5 a.m. next day, of course covered with dust. I had no time even to look round me, but I have left an impression of orchards and vineyards, and I should be quite prepared to hear that it was a beautiful and fertile place. And close before us were the Andes!

Once on the mountain-railway—it is narrow-gauge with rack-work in the centre—I had leisure to look about me. Singularly gaunt and bare were the great hills. Some snow-mountains were to be seen; to the left, some situated in South Mendoza, then Tupungato (22,200 feet or so) as a rounded summit, and to the right of this again perhaps the Descabezado with the Cerro Plata behind it. Of vast snow regions I saw nothing; indeed, I received rather the impression of snow over rock than of névé and glaciers.

Now began the peculiar desolation of the Andes as I saw them. [But it must be remembered that I only visited one part.] The line ran up a desolate gorge, at the bottom of which came tumbling down a red muddy torrent, the river Mendoza, that did not then suggest to me a glacier origin at all. It was later that I got used to red muddy glacier streams. Not a tree was to be seen; indeed, I never saw one again on the Argentine side, save at the flat bit near Uspallata, where some had been planted. Nor was there any pasture as in Switzerland, nor châlets, nor cattle, sheep, nor goats; not even waterfalls. All seemed not only desolate, but still in the act of being destroyed; the scree-slopes on the mountain-sides seemed still on the move—and later I found such slopes singularly mobile—and the river had here and there cut its way through enormous masses of débris. I saw too, what I came across so often later, vast formations of what appeared to be conglomerate rocks made out of the same

débris, I suppose by the cementing action of limestone deposited by springs (?). I was surprised to note, as far as Uspallata, near the stream, patches of pampa-grass; it seemed out of place so far from the plains.

At about 11 a.m., February 3rd, we reached Puente del Inca, a place about 9,300 feet above the sea. Here was a station, stores for railway works, mules and their stables, and a good-sized hotel. But again, what desolation! Not one tree; only thorny bushes, of which the hotel people had made a small plantation, as can be seen in the illustration. Even on the valley-bottom there was no grass, only straggling weeds.

Here I and my luggage were turned out. Owing to the forgetfulness of an Englishman whom Dr. Helbling had asked to meet me, I was now somewhat at a loss. I had no ticket for my luggage and the officials were unwilling to give it up to me. They smoked cigarettes and expectorated, while I felt forgotten and astray. At last they appeared to think it less trouble to give up the luggage than to take charge of it longer; so it was loaded on a cart and taken to the hotel. Owing to the above-mentioned forgetfulness I could only learn there that Dr. Helbling was already in the mountains—somewhere; and that he might return—sometime. Meanwhile I looked about me.

The river here has found its way through the earth and so has made a natural archway or tunnel

that gives its name to the place—"The Bridge of the Inca."

[In the illustration this natural bridge is to the left, and the stream is below, out of sight. The hotel is seen in the centre on higher ground, while the hot baths appear clinging to the side of the gorge at the entrance to the "tunnel." As one example out of many of the unreliability of the information imparted in the transitory literature of the magazines, I may mention that I have seen the view here given —or virtually the very same view—described as "Railway Works at Inca"! This view was taken from near the station, and nothing connected with the railway is seen in it.]

Paths have been cut so that one can explore the short tunnel; and one notices at once the deposits of limestone that bind the soil together and overlay it with a whitish crust. Here issue forth hot springs; and these have been tamed and directed so as to supply a series of fine baths, constituting a bathing establishment that is being further extended.

From the waters of these hot springs rise bubbles of carbon dioxide; and in the so-called "stronger" baths one feels very queer if one breathes near the surface of the water. The temperature is from 84° F. to 97° F. I think I can say that these Andine springs contain much calcium carbonate, dissolved by means of the carbon dioxide, which is as usual deposited when the gas is set free; and they also contain much of salts of sodium, potassium, and

PUENTE DEL INCA.

To face p. 200.

magnesium, which give them an exceedingly salt and bitter taste. You cannot drink them.

[I should feel confidence in the analyses of the various waters when I found two independent analysts giving the same results. But my faith in the analyses was somewhat shaken when one analyst, of established reputation, returned a report on some decidedly saline semi-artesian water in which calcium oxide appeared as the only important base, and sodium and potassium were missing; and in which the acids appeared in quantities far too great for the bases given. Other analyses showed that he had evidently forgotten to look for sodium and potassium.]

Sitting in the veranda at the hotel, there were times in the day when one might have felt Puente del Inca to be a fine health-resort; and there certainly was a wide range for the eye and very striking colour effects.

But, for me, there was too much desolation, and most of the quieter elements of beauty were lacking—no pinewoods, no grass, no waterfalls, no châlets. And after midday began the wind. O that wind! You walk sideways, holding on your hat, and the dust, dust, dust flies ceaselessly. I longed for the rest of such places as Arolla in the Val d'Hérens, in my beautiful Alps.

In the evening the Englishman turned up: "I clean forgot!" It was too late to start next day; but the day after I was to go off with

two "arrieros" (mule-drivers), whom Dr. Helbling had sent back for food (and for me), to join this companion-to-be in the Tupungato valley. So next day I wandered up the desolate hill-side and got on to a sort of summit—a mere projection standing out over the valley—whence I could see much. I had not then learned that in these regions, where everything is on a very big scale, one should use a mule as far as possible (and they are so sure-footed that one can use them very far), and only walk when the mule can go no further.

I had not any information as to the quantity of luggage that I might take with me, nor as to the time for which Dr. Helbling meant to be away, and imagined that we should make excursions of a day or two and return to the hotel at intervals. Hence I went off very badly provided, and was fortunate to be able to photograph as much as I did. I managed this last by sending to Inca for my plates, entrusting my key and a message to the first arriero whom we sent back for more food.

On February 5th, at 7 a.m., we set off. I was provided with a tough mule, used to the mountains. The saddles were Chilian, peaked before and behind; the stirrups were guarded with leather in the front, so that they were not unlike the front part of big shoes. One's foot could not get caught in them because of the leather guard, and so this danger was averted by a different means from that employed in the Argentine stirrup, in which there is no such guard. [See p. 102.]

For mountain-work there were usually two girths, one going well back behind the belly to hold the saddle on downhill, and the other much more forward. Both arrieros were Chilians. One, Evaristo Gonzalez, was much like any dark-haired European of the Latin races. The other, nicknamed the "negrito," was a wild-looking fellow of Spanish-Arab-Araucanian-Indian type. I heard that Chile was colonised by Andalusians to a large extent, and that these mixed much with the sturdy Araucanian Indians, who held their ground in a way impossible to the very inferior Pampa Indians of Argentina. So the Arab appearance of this man very likely corresponded to a reality, since there is much Arab blood among the Andalusians. His mule, by the way, had very distinct zebra markings.

Beside us three riders there were two pack-mules. Some three hours after our start, not far from the place marked Punta de Vacas in the map, we left the road and the main valley of the river Mendoza, fording the stream; and I saw Evaristo turn round and look at my face to see how I liked it. It was a very mild experience as compared with really dangerous fordings that we made later.

We struck up the Tupungato valley, which runs down, very nearly from south to north, into this main Mendoza valley; and some little way up this the men saw two birds on a small sheet of water.

These proved to be very stupid, and let themselves be caught. They were, I suppose, a sort

of coot. The toes were webbed, each separately, and had at the ends very powerful claws directed downward. The colour was a grayish-black, with a little white at the tail; the beak was yellow, and a yellow horny plate reached up between the eyes.

At my suggestion they were released again; and they actually had to be shown where their pool was.

At 11.15 we reached a powerful glacier stream, the Rio Blanco, that joined the Tupungato stream on its (true) left bank, coming in more or less from west by north. Later in the day this stream stopped Dr. Helbling's baggage-mules, and we found it quite a serious crossing.

It is wonderful what these mules could do in the way of fording! I have seen the water of these tumultuous torrents half-way up their bodies on one side and low down on the other; the pressure must have been very powerful indeed, and the footing was, of course, about as bad "as they make it." Many of my readers may have heard the stones rolling and knocking together at the bottom of such a glacier stream.

The stream passed, we halted to await Dr. Helbling and the others; and I wandered up hill-sides and glissaded back down very mobile screes.

About 4 p.m. Dr. Helbling turned up; but the baggage-mules with the tent and sleeping-bags had been stopped, as said above. Fortunately we were as yet only some 8,200 feet above the sea, and with the help of a fire and of my sleeping-gear, we passed

the night in the open in tolerable comfort, or at least without danger of frost-bite. But I saw that my Jäger sleeping-bag and macintosh double-sheet would be quite inadequate higher up. I had, however, been told already by Dr. Reichert that Dr. Helbling had with him a spare sleeping-bag of more suitable make that I could use.

Next day there was much delay in starting. The rest of the mules had to come down from the Rio Blanco valley, and then the men had to go on ahead to improve an awkward place on our side of the stream. To cross the Tupungato torrent was as yet quite impossible. When they returned, asado [it was meat impaled and roasted over or near the fire] and coffee followed, and it was 2.30 p.m. before we got off.

The party was large. The fifth horseman, not as yet mentioned, was the head-arriero, Ambrosio. He was Chilian, but European in appearance ; a sort of thinner Sancho Panza, I should say. He (like the others) wore a wide-awake, neck-kerchief, poncho, rather loose trousers, and most inefficient boots with pointed toes (our men could not act as porters, but were mule-men only) ; and he was bundled up on the top of his mule with all sorts of things about him—like the White Knight in " Alice " : a lazo, boleadoras, carbine, Dr. Helbling's ice-axe, bottles, cooking apparatus, and other things that I have forgotten.

We had five pack-mules loaded and one spare one, as well as the horse that serves to keep these animals

together, as does the bell-mare in the case of the Argentine tropillas of riding-horses. These mules carry 100 kilos in most difficult country, but 80 kilos is a more merciful load. There were also three dogs, taken to run down those guanacos of which Ambrosio dreamed. Two were rather of the Scotch deerhound type, but not so large nor so long in the head; yellowish fur (very warm), and feathery ears and tail; a curious look, half tired and half humble, in the eyes. I saw later that they were overworked and underfed. The third was rather like a very large Irish terrier, but vulgar in appearance. I may say at once that we saw but three guanacos in the three weeks, and the dogs had but one chase. Guanacos were to Ambrosio as the 20-pound salmon to the fisher of well-whipped rivers—a dream and an ambition. Soon after starting I saw, coming in on the other side, a clear stream. This was a great rarity; I saw but three in the whole time. We were never lucky enough to have a clear stream to drink from; the glacier-water that we drank was so thick with red mud that I have mistaken it for cocoa!

Towards 6 p.m. we came to the first real fork in the valley, the Rio Blanco having been distinctly a side stream. Now, the valley began to open out and showed a wide shingly bed; the continuation of the Tupungato valley lay to the south, while down the other branch, from the west by south, came the Rio del Chorillo. We made for the corner where the rivers met, and

CAMP AT THE MOUTH OF THE RIO DEL CHORILLO.

CROSSING A DRY GULLEY ON MULES.

To face p. 206.

there camped, at about 8,500 feet above the sea, I think.

Here, as everywhere, was desolation; no trees, but only thorny scrub and scant dry yellow grass, nearly swamped by the sand heaped up under the drive of the untiring wind. I shall say more later about this fight between vegetation and sand. [I may mention that quite low down, between the Rio Blanco and the Punta de Vacas, there is a region showing well how even big thorny scrub, and not only grass, is swamped by the wind-driven sand; it is a region of small sand-dunes, and our present camping-ground was another such.]

The mountain-sides seemed to be composed of unsettled débris still "on the slide"; no lichen coated the stones, no vegetation bound them together. In parts this débris had become conglomerated and stood up in cliffs over the shingly bed, here very wide, of the river; these cliffs being cut by the water in flood-time, when all the wide bed was filled. The bulk of débris on the valley-sides is inconceivable! Over the valley-bed, through which the river found its way in many branches, was spread a flooring of mud and stones, these last whitened by a slight saline encrustation. A white patch or two here and there on the hill-side, surrounded by a stain of dark green, showed where a salt spring found its way out and left its deposit of salt and limestone, and where a dark rush-like grass was called into existence. Otherwise desolation and aridity.

We sat round the fire until 10.30 p.m., and then Dr. Helbling and I retired to our tent.

From just above the camp, next morning, I saw the big Tupungato; a rounded mountain of about 22,200 feet above the sea, whose ascent is a matter, not of climbing, but of endurance under the adverse conditions of extreme cold and exceedingly rarefied air.

We started at 9.15 a.m. next day (February 7th). For some way up the valley had still this wide flood-bed; and about 10.15 a.m. we crossed the now divided Tupungato stream to its (true) right bank, and soon approached a second fork in the valley. Our Tupungato valley came down from rather east of south, while the other branch, that of the Rio de las Taguas of the Chilian map, came in from something like WSW. Up the opening of this last valley, somewhat before we reached it, we caught sight of the Pollera mountain (21,000 feet or so), or Cerro de las Polleras, which Dr. Reichert had climbed alone the year before. It lies between the two valleys, not close to either.

This Taguas valley had a wide flat bottom; but our Tupungato valley now changed entirely in character, and became more of a gorge. So we here began real mountain mule-work. Hitherto I had wondered how these animals, laden as they were, had picked their way over, among, and up and down, big blocks of stone; but now I was to see what they could do as regards the traversing of

dangerous slopes and the ascending and descending the sides of steep-sided cañons or gorges.

For we could no longer follow the river bed as heretofore; that ran in a gorge, and we had to mount much above it. The hill-side where we went was (as usual) a mass of débris, for the most part fairly compact and firm. Sometimes we had a steep rotten side to traverse, and it was not pleasant to look down from one's mule! About 12 o'clock we came to a part that seemed even to our mule-men impracticable, and they went off to reconnoitre. Dr. Helbling and I went across the bad bit—and it was long—on foot; and I noticed that he, practised mountaineer as he was, had to take extreme care. He had on unnailed riding-boots, but carried an ice-axe. Queer ground for a mule carrying 100 kilos of baggage!

It proved that there was no other way, so the mules had to come. [I may here mention the fact that on the return journey a mule did fall here and might have been killed. It had to be unloaded and was brought up blindfolded.]

We next reached a fan-shaped talus, formed on what must be called a colossal scale, of compacted débris; and through this the side stream to which it was due had, changing its course from time to time, cut various cañons. [See illustration opposite p. 206.]

We crossed one. To ascend its far side a steep climb had to be made. My mule took the top bit

at a rush, collided with Dr. Helbling's mule, and slipped over sideways. With one of those sudden movements that one can make on emergencies but could not plan deliberately, I was off in a moment with the bridle in my hand. The mule still had its front legs on the edge, and so got up; but it was a near thing.

One must never forget how serious even a broken leg is when one is some two days of very rough travelling on muleback from the main valley; what distance from a doctor, I cannot say. Another cañon completely baffled us; but at last we were able to pass its mouth down at the main stream. The descent to this, especially the critical points at which the mule changed from a "zag" to a "zig," were somewhat trying to a novice, and I needed the front peak of the saddle as well as its back girth. Ambrosio kept a look-out on the girths, I could see.

Later on we had to cross the Tupungato stream; and the water came in at the top of Dr. Helbling's riding-boot—he having forgotten to heave up his leg. Those who know what a glacier torrent is like, and what its bed is like, will wonder how the mules could stand the pressure. I did.

About 4 p.m. we came to another fork. Our Tupungato valley came down from about the SSE. and the other branch from the SW. The map does not name this last; but the arrieros called it the "Cajon del Zorro." ["Cajon" means a big box or chest; but the arrieros seemed to use it of a valley or gorge. "Zorro" is a fox. Another valley

which the map called that of the "Rio de las Toscas," which I believe means *River of the Rocks*, they called the "Cajon de Estoca," in which "estoca," I believe, meant stone or rock.] So I suppose the river may be called the Rio del Zorro.

We passed the junction, and, soon after, at 5.30 p.m., encamped. One of the habits of the hardy Dr. Helbling was to travel all day without food; so we had none from about 7.30 a.m. to 6 p.m. This camp—I can hardly say what its height was; perhaps 10,500 feet above the sea.

Some way below the camp we had roused from the stream two ducks that looked like sheldrake; and near the camp the arrieros noticed guanaco-spoors in the sandy soil. With reference to duck, I will say here that in the whole three weeks we only saw them on this and one other occasion. On the second occasion they were swimming in the glacier torrent, at the mouth of the clear stream mentioned on p. 206, holding their own against the current. And in connection with the tracks of animals it is worth mentioning the fact that one finds mules up these valleys as far as two days' journey from the main valley. [There seems little to eat; but there may be even less below, and they belonged to poor men who could not afford to buy alfalfa-hay. One of our arrieros possessed some high up in the valley of the Rio de las Taguas.] It follows therefore that tracks on the hill-sides across scree-slopes did not argue, as they would at first sight appear to do, the

presence of sheep or goats or guanacos; for these mules made such.

Next day (February 8th) we were off at 8.15 a.m., and at about 10.30 a.m. came to what one may reasonably call the last fork in the valley; though each branch did, in fact, divide again. The Chilian map puts 3,460 mètres (or about 11,350 feet) at this junction for the height above sea-level. One branch here came from south by east, and the other from SSW., and Tupungato is in a sense between them, though they do not reach far enough to embrace it. We went up the branch to our right, this time; *i.e.*, up that descending from SSW., and in about half an hour we reached a spot where some stones arranged for a fireplace, and some others for the weighting of the edge of a tent, indicated (as I understood) the previous presence of Mr. Vines one year and of Dr. Reichert another.

We were in an extraordinarily desolate spot;—a waste of stones and of the usual spiny scrub; slopes of scree; and, opposite, a hill-side of débris out of which projected small cliffs of conglomerate, strongly grooved by the action of rain, and (as I believe) of wind-driven sand. These cliffs, red in colour, looked well in morning or evening sun, and the shadows in the deep grooves heightened the effect. We saw that we were near our big mountain, but we were not in a glacier region; the snow of Tupungato, and a shrunken glacier at the end of our valley, was all that there was to be seen in this way.

The mules had to be taken up the other branch of the valley for pasture; there they could find some dry hay-like grass, and even greenstuff of a rushy nature in one or two wet places.

Every noon came the wind, and by 10 p.m. I was very cold, even with all my spare clothes on and a rug over me. At night it froze rather hard; and even in the tent, inside my Jäger bag, that again being inside a very warm, doubly-overlapping sleeping-bag that Dr. Helbling lent me, I was nearly frost-bitten at but 11,500 feet. Now Dr. Helbling's method is to carry some thirty to forty pounds of things (sleeping-bag, &c.) up to 18,000 feet or so, and then to sleep in the open. Next day he makes his shot (nearly food-less), and is prepared to keep moving for twenty-four hours [as I believe he did on Aconcagua], and then to sleep out again if necessary. For this programme I had neither strength enough nor sufficient cold-resisting power; nor had I these essential gifts even twenty years ago, when I was as young as my companion. It would have been suicide—or at least have meant loss of limbs—had I attempted it; even could I have lugged my load up. So, after a wakeful night of silent debate, I decided not to attempt to accompany Dr. Helbling, but to wander off alone, perhaps to 16,000 or 17,000 feet, and to photograph; return-ing always to the tent at night. Our compact had provided for this course.

I went off with him to his first sleeping-place. We

had to ascend (for one thing) a slope of screes, and it took us over five hours! I, the same afternoon, and he later, came down in twenty minutes, the mobility of these slopes enabling us to do something very like glissading all the way.

Dr. Helbling found he was not at all in the right place for sleeping out, and came back in the dark.

Next day I went with him again to another place; and here I noticed the *penitentes* of which I had heard so much.

I may say at once that during these three weeks in the mountains in February, and another week afterwards about Puente del Inca, I never (with one unimportant exception) met with [1] any snow-patch that had not been converted into ice (an "Irish" form of speech, but clear in meaning), nor any such ice-patch, or *clean* glacier, that was not covered with towers, pinnacles, or blades of ice varying from a few feet up to 15 feet or so in height; and this whether the ice was on a level or on a slope. These white columns or pinnacles of ice are called "penitentes," as resembling men in white penitents' dress.

It was significant of the universality of their occurrence that our arrieros used the word for snow or glaciers; "No hay penitentes por alli" ("There are

[1] I say "met with," not "saw." For I cannot be sure about all the snow seen high up on the mountains at a distance. Certainly some snow very high up was broken into penitentes, but I did not use my binoculars enough to be able to say more than this.

PENITENTES.

PENITENTES, WITH RUBBLE CONCEALING THE CONNECTING ICE-BASE.

To face p. 214.

no penitentes there") was equivalent to "There is no snow or ice there." They, I suppose, spoke of *nieve* (snow) in the winter; but in our talks of where we should find glaciers and snow, and where the hills were of rock or earth, this was the one word used.

I shall not formally join in the penitentes controversy, but shall merely give my opinions based on personal observation, supplemented by information that Dr. Helbling gave me. He had observed much.

(i.) It has, I believe, been suggested or implied that the *nieves penitentes* are the remains of avalanche-snow, which is of course much broken up. But this peculiar formation has certainly nothing to do with the snow having avalanched. In fact, curiously enough, the only snow that we saw that was unmistakably avalanche-snow was not broken into penitentes.

(ii.) An "east-to-west" arrangement of the columns, blades, or pinnacles having been noticed, this arrangement has been referred to the prevalence of westerly winds. It must be observed, however, that, whatever the direction of the upper wind may be, that on the hill-sides and valley-bottoms depends mainly on the direction of the valley. Further, the penitentes occur just as much in wind-sheltered situations as in those exposed to wind. If there be an east-to-west arrangement, this must be caused by the apparent diurnal path of the sun, that being the only constant "east and west" factor

in the conditions obtaining in these variously-directed and deep valleys.

(iii.) I have seen "glacier tables," or columns due to the protection given by pieces of rock, classed under penitentes. I may here remark that the only ice that I saw that was *not* broken into penitentes was moraine-covered ice. It was the clean ice (once snow in some cases, glacier-ice in others) that was broken up into penitentes; moraine-covered ice had the same appearance as it has in the Alps.

(iv.) I have seen the penitentes treated of as depending initially on inequalities in density due to slipping-motion or to a tendency to the same. But they are formed equally on perfectly flat snow lying on wide valley-bottoms where there was no motion and no tendency to it. I have seen this. So far I have given somewhat negative results. Positively, I would say that—

(v.) I am convinced that the penitentes are due to sun-action primarily; though the extreme dryness and coldness of the air, and the prevalence of wind, all of which would tend to promote evaporation and to prevent thawing in the shade, probably play an essential part;

(vi.) The sharper penitentes occurred on what had been snow-patches, but were, in February, ice. On glaciers they were clumsier. I imagine that the peculiar action that forms penitentes finds snow the more amenable substance to work on;

(vii.) Where the penitentes have the blade forma-

tion, it would be worth while seeing whether the lie of the land is such that the sun only gets at them for a part of the day, and therefore mainly in one direction.

Dr. Helbling and I found a patch in which all were like knife-blades parallel to one another; and it seemed to us that the sun only got at the patch about midday, and that the blades were all edgeways to the sun. [See p. 240.] I think that both Dr. Helbling and Dr. Schiller told me that this was the conclusion they had come to—*pyramids* where the sun acted through a great part of its course, *blades* where it fell on the snow in one direction only (more or less).

I noticed that the extreme mobility of the screes resulted sometimes in the stones invading the patches of ice (once snow) so as to cover the ice base from which the penitentes rose. [See illustration opposite p. 214.] One thus saw ice-columns apparently rising out of stones; but where the rubble-layer was not too thick, I dug down with my axe and found the ice flooring. This day again Dr. Helbling stayed up above. The weather got so bad that I feared for him; but next day when I was on my way up I met him returning safely. He had been obliged to use his cooking-spirit to keep off frost-bite.

February 13th was a quiet day, so Dr. Helbling went off again to sleep out. Next day (February 14th) the men set out on mules to look for guanacos, their hope being that the dogs would ultimately drive

one down, exhausted, to the valley-bottom, where they could then shoot or lazo it. They had no success. I went up high and photographed Tupungato from the ridge above our camp. I saw that much wind had arisen, and feared that Dr. Helbling would not succeed after all. In the evening he returned. He had got near the top (he thought only some 300 feet below it), but was driven back by the wind; he had narrowly escaped frost-bite. I think I remember reading in Sir Martin Conway's account of his ascent of Aconcagua that an Italian guide, accustomed like all guides to exposure and much more warmly clad than usual, was frost-bitten, though in full action, and nearly lost his legs. At such great heights men can, as a rule, move but very slowly, the sense of exhaustion being nearly overpowering; so that a strong and intensely cold wind is too much to fight against. I think I am right also in stating that Sir Martin made defence against cold *the* great point in his equipment.

On February 15th I went off by myself to explore and to photograph. I will describe my route in some detail, as both Dr. Helbling and I were convinced that it had been a mistake camping where we did, and that future would-be climbers of Tupungato must camp more or less where I will now indicate. I am sorry to say that the maps that I bought later in Santiago, and of which I have spoken on p. 194, appeared to me to be particularly unsatisfactory about this region; so that the sketch-map is not as

OUR ARRIEROS, NEAR THE TUPUNGATO CAMP.

N.E. FACE OF TUPUNGATO ; GLACIER, ETC., BROKEN INTO PENITENTES.

To face p. 218.

reliable a guide as the verbal description here given, though the dotted track marked will be a help.

Going back to the valley junction marked 3,460 in the Chilian map, I went up the other branch; that which descends from south by east. I then turned up the first valley to my right. [See p. 212, line 7.]

It was up this valley that a camp should be made; there is pasture for mules near the mouth of it. From such a camp the great north-westerly arête of Tupungato, the easy route up it, is far more accessible than it was from our camp, and a convenient high sleeping-place would more easily be found and reached.

I crossed the stream of this valley and ascended a high ridge to my left (and so on the true right-hand side of the valley). This ended, towards Tupungato, in a sort of summit on which I was opposite to, and in full view of, the north-easterly face of the mountain. To the right lay the north-westerly arête of the mountain by which Dr. Helbling had ascended to so near the top. From the face descended a glacier that drained into a valley to my left; not into the valley from which I had mounted, and which lay to my right.

Both the snow patches (now ice) on the slopes of my ridge and the glacier that lay before me were broken into penitentes. Mist was creeping over the mountain; but I succeeded in securing in my photograph a glimpse of the actual summit where some rock showed up. On my way I had come across a characteristic feature, viz., pinnacles of harder con-

glomerated débris standing out of disintegrated débris (*i.e.*, scree-slopes). Since such pinnacles resemble in shape some of the snow or ice penitentes, they also are called "penitentes," in spite of their not being white. The "penitentes" near Puente del Inca, well known to and visited by tourists, are of conglomerate. [So the word penitentes is used of two quite different formations.]

It must have been about 5 p.m. when I turned back. It was solitary there! I realised that no one knew where I was, that I had to find the way back partly in darkness, and that the camp itself was at least two long days' journey from the nearest men. I was used to solitary wanderings in Switzerland, and to disregard the chance of "spraining an ankle" as very remote; but an uncomfortable condition here was the intense cold at night.

I reached the camp in the dark, and found Dr. Helbling, I cannot say anxious, but beginning to think it possible that he might soon begin to wonder where I was; he was too much accustomed to far more serious solitary climbing to feel really anxious. So ended a week at the top of the Tupungato valley. Save for its giving access to Tupungato I do not recommend this valley at all! Climbers might spend a month up the Rio del Plomo valley with more profit and pleasure; and I think that Dr. Helbling spoke more favourably of the Rio Blanco valley.

On February 16th we broke up camp, Dr.

Helbling leaving Tupungato unclimbed; and at 9.15 a.m. we set off down the valley again, our objective being the glacier region at the head of the Rio del Plomo, to gain which we had to turn up the valley of the Rio de las Taguas (of the Chilian map) already mentioned.

Note.—In my notes I called the face of Tupungato that is shown in the illustration facing p. 218 the "northerly" face; and the arête by which the mountain was attempted by Dr. Helbling the "westerly" arête. A study of the map bought later made me alter these into "north-easterly" and "north-westerly" respectively; for I had not much confidence in my jammed compass. Still, I here record what I actually took down at the time.

CHAPTER XII

TO THE GLACIER REGION AT THE HEAD OF THE RIO DEL PLOMO VALLEY—UP THE VALLEY OF THE RIO DE LAS TOSCAS (OR CAJON DE ESTOCA)—BACK TO PUENTE DEL INCA

It was an easy day for us, this descent from our Tupungato camp to the mouth of the Rio de las Taguas ; and the cañons that we had crossed before did not seem quite so formidable the second time, though twice a mule fell. We reached the Rio de las Taguas about 4.30 p.m. ; and, turning up this valley, camped near the mouth of it at 5 p.m. on the (true) right-hand side of the river. Next day (February 17th) we set off at 10.15 a.m. Dr. Helbling soon stayed behind to take some survey measurements, while I went on with Evaristo. The negrito had gone back to Puente del Inca for supplies. About 12 o'clock we came to a warm saline spring, the water of which had deposited a huge fan-like sheet of calcium carbonate that ended on the main valley-river. The more soluble salts remain in the water, and so there was a very thin sheet of exceedingly salt and bitter water flowing over this white terrace, and

falling in miniature cascades over the edge of it. Up on the hill-side I could see another, smaller patch of white crust due to another such spring.

Where the water came out from the ground there grew dense masses of dark green rushes and rush-like grass, as well as another kind of grass of gray-green leaves spiked at the end; and the water was full of slimy green vegetable growth; the arrieros, by the way, called this last "monte," though this word in Argentina always referred to collections of trees.

I stayed behind to photograph, and soon afterwards had a curious experience of loneliness again. In the Swiss mountains I feel at home; but here, where one had to do with the capabilities of mules, to judge when their resistance was sheer cussedness and when it meant that they knew they could not do a thing, and where one had to judge whether a muddy glacier torrent could be forded, I must admit that I felt at times quite an inexperienced novice; I longed to be on my own feet with an ice-axe in my hand.

Well, when I had finished my photography I followed Evaristo's tracks as well as I could, and at last found myself on the shingly river-bed. To my right lay a powerful glacier stream, and, further on, this swept the base of conglomerate cliffs on my left. It was necessary either to ford the stream or to get the mule up a steep-sided and rugged-bottomed cañon that opened on to the river-bed just below the

cliffs. The mule refused the stream ; the mule refused the cañon. I did not wonder ; had I been a mule I should have refused both. Evaristo and his pack-mules had vanished on ahead. In about an hour's time I began to wonder whether Ambrosio and Dr. Helbling had passed me by some other route struck earlier and lying further from the stream. It was a queer feeling, being there alone ; a reserved and obstinate mule is not a companion.

To my relief, in an hour and a half Dr. Helbling and Ambrosio came up behind me. The mule had been right to refuse the stream ; Ambrosio would not venture to cross it. He dismounted (as did we others) and dragged his unwilling animal up the cañon. It was indeed bad going ; no wonder that I had not attempted it. Later on we *had* to cross the stream. Ambrosio as usual managed this very skilfully. He took such a place of crossing, and such a course, that in the worst part the direction was partly down-stream, and so an overwhelming side-pressure was avoided. But he watched my animal quite anxiously, I could see that ; there was real danger in this fording.

The torrent we had crossed was the combined stream of the Rio del Plomo, which is the upper part of the Rio de las Taguas, and that of the Rio de las Toscas, which came in about here. [Later on, when we went up the valley of this latter river, I took a view of the Rio del Plomo valley in which the snow mountains at its head showed to some extent ;

VIEW ACROSS THE RIO DEL PLOMO FROM OUR CAMP.

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and, in spite of the desolation of the Andes, it was beautiful.] We were now, therefore, on the true left bank of the Rio del Plomo, and we were making up it in a direction about west by north, and later WNW.

Cutting off a corner by rising on the hill-side, we soon descended on to a very wide, flat shingly valley-bottom (the river-bed in flood-time), and passed some curious saline springs that I shall describe later.

On this (true) left bank of the Rio del Plomo you cannot reach the glacier on mules; there are cliffs, whose base is swept by the torrent, about one hour below the glacier, that cut you off. And we found that we could not now ford the stream; it could only be forded up to about 10 or 11 a.m., before the sun's action on the glaciers had swollen it excessively.

So we had to camp this side of the cliffs.

From our camp the shoulder that ended in these cliffs hid the glaciers; but opposite to us were three fine snow mountains that we nicknamed the "Monch, Eiger, and Jungfrau." Next day (February 18th) we set off with mules to see "where we were," and mounted the shoulder. From it we had a fine view down the valley, as also of the mountains opposite to our camp; and we now saw something of the big glacier region that headed the valley. There were two main glaciers that joined near their common end, and from a hole in the terminal wall of ice the torrent issued.

Further than where we were the mules could

not go on this side; but a (veritable) guanaco-track (it proved to be covered with guanaco spoors) down the cliffs showed me where I, or any man used to wandering in the mountains alone, might safely descend on foot.

So next day, when Dr. Helbling went across the stream with his instruments and mules and drivers to reach the glacier by the other bank and to sleep out near it, I went off with my camera, to spend some hours up on the glacier, by way of the shoulder and guanaco-track on this side.

This independence was characteristic of our wanderings; Dr. Helbling had been used to it, and I had wandered alone much in Switzerland. Characteristic also was the way in which we ran short of food. Sometimes we had no meat, sometimes no biscuit or bread; I have been out for a whole day alone with but four sticks of chocolate to eat and only muddy water to drink. [I might have had more chocolate, but I always find this too sickly for me on the mountains.]

I started at 7.15 a.m., topped the shoulder at 8.25, and, after some halts, reached the well-defined lower end of an old terminal moraine at 9.30. This showed a retreat of the glacier of some half mile or more.

I found that the glacier ended off in an extremely curious way. Down to very near the end it was a descending stream of clean ice, broken into penitentes of clumsy form, with the usual lateral moraines.

GLACIER-REGION HEADING THE RIO DEL PLOMO VALLEY.

THE RIO DEL PLOMO ISSUING FROM THE GLACIER

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But right across the end stretched a high ridge of moraine-covered ice. A person descending the clean ice in the centre of the glacier would, near the end, lose sight of the valley and find himself sunk in a hollow in which a good deal of water stood on or flowed across the ice. Behind him would lie the clean glacier that he had descended, and before him would rise this transverse, moraine-covered barrier of ice. Mounting this, he would again come in sight of the valley, and would find himself at the top of the terminal ice-cliff from whose foot the river issued. What puzzled me was the abrupt change from clean to dirty ice. Granted such a band of débris across the end of the glacier, its protective action would result in there being formed an elevated ridge. But how did the band come there?

I looked to see if a lateral moraine could have been deflected and forced across; but I found no evidence of this.[1] The only way (as far as I know) in which such a cross-belt of rubble could appear at the end of a relatively clean glacier is by débris, lying buried under the ice higher up, coming to the surface through the melting action of the sun on the cleaner ice lying over it.

The glacier, as said already, had two branches. Coming down directly in the direction of the valley, which was here about NW. to SE., there was a shorter and wider branch—really a huge region —ringed in by snow mountains. In spite of its apparent (relative) shortness, I think that very

[1] Nevertheless, this may have been the explanation.

possibly this should be called the main branch. It was, of course, a mass of penitentes.

Coming into it from about WNW. was a very long branch, broken into more striking penitentes, whose source lay in mountains that were much further off. And into this, again, the mountain group opposite our camp sent a tributary. The penitentes of this last showed up very well, silhouetted against the mountain-side beyond.

I left the photographing of the shorter branch (which I have said might be called the main branch) for another day; and I made my way up the true right bank of this WNW. branch and photographed it. Its penitentes, and those of its tributary, came out fairly well, but of course disappointingly small.

About 1 p.m. I set off back, crossed the combined glacier again, and regained my old tracks on the (true) left bank of the stream. Here I was hailed by Dr. Helbling, who, as I have said, had gone up on the other side. He had a message to send to Ambrosio; but, though the stream was not broad, the roar of the water was so loud that at last he had to write his message and throw it across in a weighted handkerchief.

Between the shoulder spoken of as reached by us on mules on February 18th and the camp, I came across a good example of a mud avalanche and what it ultimately leaves behind. The mud acts as a lubricating and carrying medium, and stones and big rocks are thus borne along over nearly level ground.

W N.W. BRANCH OF RIO DEL PLOMO GLACIER, AND A TRIBUTARY TO IT, BOTH BROKEN INTO PENITENTES.

TYPICAL CLIFFS CUT IN DEBRIS BY RIVER WHEN AT FLOOD-LEVEL.

To face p. 228.

Then comes rain and washes out the mud: and one wonders how the stones and rocks got there. One sees this in the Alps, too.

February 20th was, for a wonder, rather a wet and cloudy day. So I went down the valley to visit the saline springs that we noticed on our way up to our present camp.

As I descended I photo'd some typical cliffs cut in the débris at the edge of the wide flood-bed of the river down which I was walking. [See illustration.] At one place in these red, earthy cliffs there cropped out low cliffs of a white rock veined with gray; and this rock, quite hard (like marble) when newly broken, weathered into a soft white powder that had a saline taste. It was close under these white cliffs that there originated a line of remarkable saline springs. And this was its fashion. Starting from the base of these white cliffs was a white or discoloured belt that widened as it went, ending, some 350 yards down the shingly flood-bed of the valley, in a branch of the river. This belt was remarkable for holes, or pits, varying from 3 or 4 feet across and 1 foot deep to 12 or 15 feet across and 5 or $5\frac{1}{2}$ feet deep; and there were others partly filled up and evidently inactive. Speaking generally, these pits had each an overflow-channel from its lower lip (the word "lower" referring to the edge of the pit that was furthest down the gently sloping valley-bottom); and a few had in them bitter and saline water. The overflow-channels were deeply

coloured with red and orange, due to ferric hydrate (an oxide of iron), I am sure; and this red powdery soil was very saline. Between these red or orange channels the surface was crusted with bitter and saline white salts; but underneath this the soil was red or orange. The ferric hydrate appeared to come from those pits that lay nearer the cliffs; but some of it drained, through the channels, into others further off. I may mention that when we descended again our mules ate some of the mixed salts and ferric hydrate. [See illustration facing p. 232.]

It was clear that, at times, saline water welled up from places in the valley-bottom and formed these pits by so welling forth. In pits once formed, subsequent discharges would naturally overflow at the lower edges, and so the channels would be cut out. There was no activity then; only three or four pits had some saline water at the bottom; this was cold, and bubbles of air or gas kept escaping from it.

On February 22nd I went off again (practically foodless!) and mounted the glacier. This time I crossed that branch up which I had gone last time, and mounted a high shoulder between the two branches. In crossing, I had to find my way between coarsely formed penitentes—very unlike the sharp pinnacles or knife-blades that I had found on old snow-patches. These were more like séracs; but there were no crevasses, the ice having been thus broken into pillars, &c., by some other action than that of the steep or irregular bed that causes a glacier to split up

into séracs. On this shoulder I lost sight entirely of the branch I had been up before, but had a magnificent view of the wide "main" branch of the glacier (as I have called it) and the ring of snow mountains surrounding it.

Save for the penitentes, which, in the clumsier form in which they occurred on this glacier, might almost be mistaken for séracs—(if one did not wonder what séracs were doing on a glacier of such gentle slope!)—the whole scene appeared to me quite familiar; I could almost have believed that I was on some "Concordia Platz." And I could hardly believe that I was hours from the camp, the camp two long days or more to Puente del Inca, and Puente del Inca separated by enormous distances of land and sea from Switzerland; nor that, the same evening, I should be eating sheep's ribs with my fingers at a camp fire, and later see Orion standing on his head. Indeed, after twenty-seven years of routine teaching, and even routine boating and bicycling, I had, all through this Andes expedition, a great difficulty in realising that I was myself. To be actually camping out in the Andes—it seemed incredible!

On February 23rd we broke up camp. In descent, instead of crossing the combined streams of the Rio del Plomo and Rio de las Toscas, which together form the Rio de las Taguas, at the part where we had found it so dangerous when we came up (see p. 224), we kept down the (true) left side of the river until nearly opposite to the hot springs; and there we

crossed at a part where the river was more broken up into branches. We were very sorry to leave the Rio del Plomo valley. With its snow mountains and all, in spite of the lack of trees and good grass, it had a beautiful aspect.

As we came down the Taguas valley, and before we forded, the negrito had gone up the hill-side to inspect some mules of his. Suddenly I heard an excited cry from Ambrosio, and, turning to look, I saw two animals, that shone a rich red-brown in the sunlight, "loping" with a very peculiar camel-like or giraffe-like gait up the wide valley-bottom some way off. I knew at once that they could only be guanacos. The three dogs went off swiftly and silently; Ambrosio bundled after them with all his odds and ends joggling about him, and the negrito came madly down the hill-side on his surefooted mule. [Evaristo had already been sent to Puente del Inca for bread and a sheep; our provisions had shrunk, some days earlier, to bones, potatoes, and coffee.] Soon Ambrosio came back; he had the mules to see to; later came the negrito, and with him one dog—who looked very humble.

We camped some 100 yards from the hot springs, and Dr. Helbling and I had a luxurious bathe—our first wash (I fear) for about two weeks. You cannot (unless very young) bathe in the icy glacier streams.

Next day (February 24th) we set off on mules to ascend the Cerro Rotondo, a rounded summit on the wedge that lies between the Taguas valley and the

ONE OF A SERIES OF CURIOUS SALINE SPRINGS.

SURVEYING ON THE CERRO ROTONDO.

To face p. 232.

upper Tupungato valley. We started at 7.15 and went at first down the valley (on its right side) towards the junction of the two rivers. Soon we came across the two other dogs. I will give their history; it explains why they looked so worn and sad! They had had *some* food on the evening of the 22nd, none on the 23rd. On the 23rd they had chased the guanacos; and, I suppose towards evening, had returned, and had swum branch after branch of the cold and turbulent river; and there they were on the 24th, making for the mouth of the river where we had camped before. And now they had to follow us up-hill, and were to get no food until the evening! A forty-eight hours' fast, with hard work, cold water to cross, and frost at night.

Near the junction of the rivers Ambrosio found a possible way up—possible to such mules as ours. The higher we got, the stronger was the icy wind. Dr. Helbling and I were properly clad; but Ambrosio and the negrito felt it much—the latter almost wept! On one narrow neck my mule (with me on it) was very nearly blown over a cliff; but I gave it a timely pull with one rein, and it recovered itself. At 11.15 we were nearly up; and, considering the steepness of the route and the pace of the mules (who scramble quickly *up* steep places, though they are leisurely and careful in descent), I should say we ascended some 4,000 feet or so, and were therefore over 14,000 feet above the sea.

Dr. Helbling took measurements of the surveying

nature with his photographic theodolite apparatus; and the negrito looked very funny as his assistant. [See illustration opposite p. 232.] There was a strong element of the child in this wild-looking fellow; and now he appeared most naïfly surprised and pleased to find that he was so clever as to be able to help in surveying-work.

I took several views; that up the Tupungato valley was very interesting, and showed Tupungato far off; and I was glad to have another showing Pollera in the distance. This latter mountain can also be seen, to the left, in the illustration which shows Dr. Helbling surveying.

Dr. Helbling *had* arranged for some lunch to-day! At 3.30 p.m.—*i.e.*, after the quite short interval of about nine hours since early coffee—we had each a cup of hot chocolate, two sticks of chocolate to eat, and three biscuits; more than I ever had when off for the day alone. [I may say that our main provisions were raw potatoes, to be cooked, raw meat, or bones, to be cooked also, and very hard "biscuit" that one had to soak in hot soup or coffee. Hence there was little available for lunches, and I appeared to be the only one who hankered after food at midday.]

Rather later, Dr. Helbling and I found our way home on our feet, doing a lot of glissading down the endless and mobile slopes of screes. [I was glad to find later that, sturdy mountaineer though he is, Dr. Helbling had noted with respect his elderly companion's ability to tackle rough terrain. He regarded

as my one weak point my inability to stand sleeping out, high up, without a tent, and considered this inevitable at my advanced age. I felt quite pleased when I heard this!]

We had intended next to go up the valley of the Rio de las Toscas (or Cajon de Estoca), but Evaristo had not turned up and the food had run out. Both the night before and this night the men set fire to big bushes of the inflammable acerillo as a signal; and to our relief Evaristo came up in the dark, guided by this fire, and brought ample supplies (relatively speaking) with him. How he made his way across the river and over the rough ground in the dark I do not know; perhaps he had crossed the water before night fell. It turned out that there had been no bread in Puente del Inca, and he had waited until some was baked. By the way, after our cold camps up the Tupungato and Plomo valleys, the camp here seemed very warm. Yet in the morning there was "cat-ice" where the very saline water from the warm spring flowed over the limestone terrace.

Having now some food, we set off about 11.15 a.m. on February 25th for the Rio de las Toscas valley, but we were a smaller cavalcade, since the negrito had been sent back for good and all with some of the mules carrying the instruments and part of the other baggage to Puente del Inca. Of course, we had first to re-ascend the valley of the Rio de las Taguas to the junction of the Toscas and Plomo rivers.

This valley of the Rio de las Toscas was more of a gorge. The only practicable way up it was rather high up on its (true) right-hand side, and even there we had rather queer passages. I understood that only one party had explored this valley before us, and that was a part of the Boundary Commission who had gone to set up a mark on the frontier at the head of it near the "Port. del Morado," a pass marked in the Chilian map as being 4,962 mètres (or 16,280 feet) above the sea. This party had travelled with a host of mules, I feel sure; and certainly we found a kind of track, as we had, in parts, up the other valleys. But these tracks failed us, as a rule, when difficulties came; for the dangerous bits were usually steeper parts where the débris that formed practically all the hill-sides was continually slipping, destroying any track. About 2 p.m. we came to a division in the valley, a stream coming in through a gorge on the other side (*i.e.*, on its true left side). We continued nearly straight on, going about south by west.

I had observed that saline springs with their calcareous deposits had been very numerous across the river, and that there were not only surface sheets of these deposits, but also what appeared to be cliffs and also strata of them. The cliffs were really conglomerate cliffs overlaid with this crust, and the strata were (I feel sure) sheets that had once been surface-sheets buried by fresh slides of débris from above; for of the extraordinary mobility of the débris I had had evidence enough. Especially at and near the

mouth of this tributary were the incrustations abundant. We went to see one big spring and found both it, its rushes, and its terrace of deposited limestone very like what we had had at our last camp, only the water was cold.

As dusk was coming on we reached what appeared to be the end of all things. In reality we were not nearly at the head of the valley, but we seemed to be.

Straight ahead the view was cut off by a vast, desolate-looking mountain of rock and scree-slopes. To the right of it there appeared to be an insignificant gorge, down which the river came (as we found later) in a cañon, like that of the Via Mala (in Switzerland), but on a smaller scale. From the left, as we looked upward, there descended into our valley from another gorge, at whose head lay a small glacier region, a tumbled mass of débris of incredible magnitude that was carried forward on ground of but slight slope to such an extraordinary distance that I wondered whether it had not come down originally as a mud avalanche (see p. 228). We seemed shut in, and, apart from the fact that it was too late to attempt the difficult-looking gorge down which the river came, we saw that we had already slightly passed the limits below which anything could be found for even our hardy mules to eat.

So we turned back a little and soon found, concealed in a narrow inlet cut by water in the banks of débris, signs of the Commission having been there before us; for, for the first time in these wanderings,

we found empty wine bottles—and plenty of them, too!

What a God-forsaken region it was! And what inhumanly desolate, arid, man-repelling mountains these Andes were, so far as I had seen them!

Yet were I younger and at work out in the Argentine I should certainly be drawn year after year into the mountains, as Dr. Helbling and others are. There is a fascination about the life—the wandering on mules, the sitting out by camp fires, the exploration of glaciers, and the walking up on to shaley ridges of 16,000 feet or so, even if one never climbed a peak. But I feel pretty sure that with some expenditure of money on eiderdown one could devise covering that would enable even an ordinary man like myself to sleep out, and that with warm gloves under waterproof outer gloves, and boots made on the principle of a recent form of ski-boot that I have seen, even such an one as myself could stand the cold in the final ascent. I do not think that it is necessary to have the weight-carrying powers or cold-resisting powers that I found Dr. Helbling possessed in so remarkable a degree. I have in my mind dodges—but, alas! it is too late for me now; all that I can do is to offer to communicate my ideas to any one who would like to have them, and with that I must pass on. [See hints given later, pp. 246, 247.]

This was the very coldest camp we had been in. I cannot give our height, but, judging by the vegetation, I should say that it was 12,000 feet above the

CAMP UP THE RIO DE LAS TOSCAS VALLEY.

MOJON NEAR THE PORT. DEL MORADO ; ABOUT 16,500 FT. ABOVE THE SEA (?).

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sea at least; certainly higher than our camp in the Tupungato valley.

Next day we set off at 9.15, and I presently discovered that our director, Dr. Helbling, with his usual independence of food, had not made any provision for lunch!

We soon reached the head of the visible valley and then went up the narrow gorge to the right. Below us the stream was hidden in a deep cañon, and even where we went the mules had to be led at first. After this the valley widened out somewhat and presented no difficulties for a long way. We crossed the stream and presently came to the junction of the two head branches of the valley. One came from about west by north; it was fairly open and showed us a ring of snow mountains at its head. The other, descending more from the south by west, looked less attractive, but it was the branch we were to follow. However, it proved to be much the wilder and the more interesting as well as the longer of the two. The stream from the former branch was a glacier-stream and was red and turbid as usual. That down our branch was of clear water. I was surprised to see that, even at twelve o'clock under the fierce sun, this stream showed as a ribbon of white, being, in fact, nearly entirely frozen. Even at 4 or 5 p.m. there was ice all along it. Considering that it ran down a nearly bare valley, the soil and rocks of which would greedily absorb the sun's rays in the daytime, this gave a strong impression of the pitiless cold of

the nights even in summer and below the (so-called) "snow-line." The confusion of débris and rocks here, at the end of the world, was wonderful; indeed, it was such bad going that for a considerable distance our best route was up the bed of the half-frozen stream.

About twelve o'clock we sighted the *mojon*, a boundary mark in the shape of an iron erection some ten feet high or so on the frontier ridge on ahead. And at about 12.30 p.m. Dr. Helbling and I set off on foot to reach it. [See illustration opposite p. 238.]

The valley had ended in a sort of wide basin, and here and there were snow-patches (now ice) that were bristling masses of fantastic penitentes. Unluckily, I had no plates to spare for photographing them.

We crossed one such patch on a slope. In this the blade formation was very marked. Looking up the slope, you saw between the knives edgeways; looking across, their broad sides hid the view. I have referred to the penitentes of this patch already on p. 217. At 1.15 p.m. we were on the ridge and looked down into Chile, and in another half-hour were by the mojon. This was at some height above the Port. del Morado, and so, if the Chilian map be right, it should be about 16,500 feet above the sea. Thus we were considerably higher than Mont Blanc, and yet were on a bare shale ridge.

Very far off we made out Aconcagua, and comparatively near us was a big mound that showed no sign of glacier and very little of snow. Yet this last, from its position, was certainly the 22,200 feet (or so)

Tupungato. Such an unpicturesque hump it looked! Returning, we reached our camp late; it was *very* cold, and we ran short of fuel.

Next day (February 27th) we started back for Puente del Inca, and, pressing the pace a good deal, trotting over flat river beds and cantering over sand when we had such easier terrain to traverse, we managed the whole distance in two long days, sleeping only at our old camping-ground by the mouth of the Rio del Chorillo.

So ended my first and last expedition into the heart of the Andes.

CHAPTER XIII

SOME GENERAL NOTES, OBSERVATIONS, AND HINTS RELATING TO MY EXPEDITION INTO THE ANDES

Photography.

THE photographer has several conditions to bear in mind. His baggage mule may fall, or get into a stream, as may his own riding-mule; so he should have apparatus, to a certain extent, in duplicate. It is not easy to stop the whole train of mules on the way, and so he should be prepared to take photographs without keeping everyone back while he gets ready. Further, one is apt to feel weak high up, and weight is a consideration. Then again, for photographing plants and flowers, one needs a long extension camera. And lastly, the prevalence of wind and dust has to be allowed for.

Putting everything together, I should say that it is desirable to have two cameras, both portable, and both capable of being used on a small stand, one lighter than the other. The lighter is to be carried, slung round the shoulders; it can then be held under the arm during trotting or cantering. This camera need not have long extension (which always involves

extra weight), but should have a rising front and a fairly quick shutter. The heavier camera should have a rising front and a long extension, and also be capable of being carried slung, like the other ; and it should be provided with plenty of padding and a waterproof case, so as to make it secure against immersion in a river and against the shocks of falling. Its lens should be double or triple, so that one can use a single cell only and thus get larger views of distant mountains ; but it is essential, having regard to the drifting sand, that the *front* cell be then used ; otherwise dust will get in.

Reserve plates and films should be, like the second camera, protected against both immersion and shocks.

As regards arrangements for changing plates or films, I will only say—remember the dust! A huge red bag, into which the head, arms, and half the body can be inserted, should do very well. The great advantage of this, over the red-lamp system that demands a dark chamber, is that one can then change plates out of doors when on an expedition. Perhaps, however, that daylight-changing "envelope" system (Houghton supplies one form, and I saw another at the Army and Navy Stores) would be still better. I have not used this myself.

One further hint. I had read that, if (*e.g.*) $\frac{1}{100}$ second were the exposure in the plains near sea-level, then at elevation between 7,500 feet and 12,000 feet the exposure should be $\frac{1}{200}$ second. If the photographer have found the right exposure on the

brilliantly-lit plains of Argentina, I do not think that he should risk so much reduction at 7,500 feet in the Andes. I myself found that I did very well with the *same* exposure at Puente del Inca (over 9,000 feet) as in the plains, using the same camera at both places.

Mules and Mule-men.

About mules, one has to "know the ropes." At the hotel they were asking $1 Argentine (about 1s. 9d.) *per hour* for mules. Yet I know that mules were to be had for longer engagements (at any rate when several were taken) at $1½ per twenty-four hours, including the mule-driver! More than this I had better not say; I am treading on delicate ground. If a traveller can get behind the scenes, joining with some Anglo-Argentine or other European who knows the country, the latter can arrange matters. But if he cannot do this, and cannot be put in the way of making a private bargain with an owner of mules, he should write to "El Sr. Administrador, Hoteles Sudamericanos, Seccion Campo, Mendoza, F.C.P., Argentina."

At any rate he will *not* have to pay at the absurd rate mentioned above; and he can bargain. Two climbers would do well to have three arrieros (as one has to be sent back now and then), and therefore five riding-mules; and, say, three or four baggage mules, perhaps a spare one, and the usual idle horse to keep them together. As already said, a mule will carry 100 kilos, but 80 kilos is a more merciful load.

Provisions and Luggage.

Strong wooden cases, such that two slung one on each side of a mule together weigh about 80 kilos when full, are good for stores; and it is well to have one long enough to contain the ice-axes. These cases should be sent up to Puente del Inca in advance by goods-train from Buenos Aires with stores of Nestlé's milk, jams, &c. Of course yerba (with the corresponding maté gourds and bombillas), coffee, sugar, and macaroni can be sent up also if the traveller can learn about how much is wanted; but these can be bought at Puente del Inca. Cooking vessels, enamelled iron plates and cups and such-like, must also be sent up. Dr. Helbling had strong aluminium vessels for cooking purposes, beside his lighter etna intended for carrying up higher where mules could not go. There is a "store" at Puente del Inca, and it would be well to arrange beforehand about prices. The main things for which we sent back the men were bread, biscuit, coffee, sugar, macaroni, and sheep; these last killed and cleaned, but with the skins on. Up where we went, meat in the shade would keep good for an indefinite time.

It may be useful to would-be explorers of the Andes if I state that when I paid over to Dr. Helbling my share of the expenses (for food and mules and all) of the three weeks' expedition from Puente del Inca as a base, I found it came to about £45. Of course,

his kindness in letting me join when he had already arranged everything and had his usual outfit with him made the expense for me relatively small ; but at least it can be seen that two travellers, who are already in the Argentine, can explore the Andes, in the way in which we did things, at moderate cost.

Porters and Guides.

I was told that at least two men who can use an ice-axe and climb a mountain can be found at Puente del Inca or thereabouts. Enquiries might be made about them.

Clothing, &c.

It would be out of place to attempt to give here a list of things required for camping out in mountains generally. I am confining myself to some hints that seem to me to be useful for the Andes in particular. And as regards clothing, I would say that any intending climber will get some idea of the cold if he reads Sir Martin Conway's book about Aconcagua. Even at 12,000 feet only, and inside a tent, one had to close up every crack round the neck ; and I was cold even with a Jäger sleeping-bag inside a heavy one that Dr. Helbling lent me. In that, by the way, there were air-cushions to go under the body; *these were essential.* I should be inclined to say that it would be well to devise something out of eiderdown, with air-cushions too, if by trial these were found necessary; and that there should be a strong bag,

waterproof, to wear outside this in camp, and a much lighter and less durable one to carry up when sleeping out higher up. Perhaps instead of the complete eider-down bag one might have a jacket and hood, and a leg-bag to meet this. In any case there must be a well-devised overlap at the junctions.

For boots, I incline to a new sort of ski-boot, with a single seam down the top, that I found at Dethleffsen's at Berne. But these should be a model for shape only; the actual boots should be stronger, and their seams better closed. The great advantage of these is that you can get any amount of warm foot-clothing inside them; and, though so big, they do not fall into folds as do big mountain boots. Large boots, frozen in folds, are virtually small.

It must be remembered that over 18,000 feet or so a man probably cannot climb difficult rocks or do difficult ice work as at lesser heights; it is usually as much as he can do to walk at all. Warmth is the essential thing; and I feel pretty sure that these clumsy boots, with crampons on if necessary, will serve a man well enough for any climbing that he is capable of at such great elevations.

Hand-gear, too, requires consideration; certainly warmth and free movement inside, and an external wind-proof covering, are essential. The intense cold and the prevalence of wind must never be lost sight of. Of course a tent should be taken; and one must allow for strong winds and for stony ground. Lots of metal tent-pegs are required; our wooden ones broke.

The General Aspect of the Mountains.

I think that I have already said nearly enough about this. What struck me everywhere was the active disintegration that was going on. The scree-slopes were slipping, so that none were gray with lichen; the wind worked at the hill-side and tore up sand, with which it heaped up dunes and buried the bushes; the rivers ran thick with mud. Well could one imagine how, in old days, when shallow seas reached the base of the mountains, the detritus was carried out into these and formed the present vast plains of Argentina; sandier nearer the hills, of finer alluvial mud further off.

No doubt the aridity helps on the destruction. Save for a salt spring or so here and there, all is dry; and this discourages the growth of herbage whose roots would bind the débris together.

Glaciers and Moraines.

If a glacier retreats from age to age without there being any periods during which it again increases, it seems pretty clear that it can but leave the hill-side strewn with débris. It must surely be the halts, with periods of partial recovery (known to have occurred in the Alps), that produce those ridges of old lateral moraine familiar to haunters of Switzerland. I saw no such old lateral moraines in the Andes in my limited wanderings. If they be indeed generally absent, it would seem to argue that—

(1) *Either* the glaciers there have not had periods of increase or partial recovery breaking the main decrease ;

(2) *Or* the degradation, which is so rapidly going on there, has obliterated such old moraine ridges.

Speaking of moraines, I remember a very curious feature in the Andes.

Many of my readers know the 'Zmutt glacier, and remember how it is strewn with débris.

Well, up the Tupungato valley and also near Aconcagua I saw what appeared to be glaciers made of débris ; no stream was to be seen coming from the end, and so I concluded there was no longer any ice underneath. I take it that, here, glaciers laden with débris had disappeared and the débris had been left. But imagine the destruction that must have been going on, when the top layer of débris left by a vanished glacier is thick enough to look like a glacier made of débris ! Near Aconcagua I saw also another such in the making ; the top layer of débris was *very* thick, but there was water coming out at the end, which argued the presence of ice underneath the rubble.

Penitentes.

Of these I have spoken already (see p. 214 *et seq*).

I will only add two remarks :—

(1) No one should attempt to explain them who has not seen them. One may see something like them, only on a miniature scale, in Switzerland. But when one sees glaciers, snow-patches on the level, and

snow-slopes on mountain-sides bristling with these strange pinnacles or knife-blades, one is amazed.

What *is* the condition that is here so different from any that prevail in the Alps?

All that I noticed was the more powerful sun, the far colder and drier air, and the wind. The painful cracking of one's finger-tips was one sign of the dryness of the air; the absence of excessive perspiration another. I should say, too, that one's ability to withstand the sun even in a common cap was another sign.

All pointed to a melting under the sun's direct rays, with no melting in the shade, and an unusually rapid evaporation.

(2) No one, I believe, has yet observed the snow from the very beginning in winter. The regions in which the penitentes are found in summer have, so far, been inaccessible in winter, so that their life-history has never been followed.

I think that much might be done from Puente del Inca as a base.

Bushes.

When I come to the vegetable and animal kingdoms, I am obliged to speak as a layman; I have, in this department, no scientific knowledge at all. Still, some observations may be of interest.

Where I went, there were no trees; neither on the way up from Mendoza (save some planted at Uspallata), nor still higher up in the mountains. Of bushes

and scrub there was plenty, and these were all dry and thorny.

About Puente del Inca and up to (say) 10,000 feet above the sea there grew the thorny *acerillo*, a bush of man's height or so. Every bush seemed to have dead branches in it; certainly you could, with a piece of paper and a match, set fire to the lower part of any living bush and cause the whole to blaze. This was our fuel until we reached our highest camps; there it did not grow. Its leaves were like little green rods with a groove down them that merely suggested a central rib.

Overlapping this, and growing as high up in the mountains as any scrub, was the lower and smaller *cuerno de cabra*, which was still more spiny. Lower down, this grew more loosely; but, higher up, it settled down to the form of a low boss (like gorse kept down by sheep) whose rounded surface bristled with formidable branched spines. Its leaves were ordinary simple leaves with a central rib, more or less of the shape of (*e.g.*) privet leaves, but much smaller.

Again, growing as high as this but never so low as to overlap the acerillo, was the *yareta*. This resembled the cuerno de cabra, but it formed denser bosses, and its twigs seemed thick and swollen. This swelling appeared to be due to a protective (?) covering of a waxy substance that, when the plant was dead and decaying, peeled off in very inflammable scales. Its leaves were like those of the cuerno de cabra, but

narrower; and they were so folded together about the central rib that at first glance they appeared to have the rod-like formation of the acerillo leaves.

Returning to the extraordinary advance-guard of spines that guards every boss, and that so suggests defence, one naturally thinks of "survival of the fittest" as the explanation of the spiny character of all the plants. But there are practically no grazing animals to eat them; the wind, the aridity, the cold are the enemies. I would (though quite ignorant in this department of knowledge) venture the guess that, under the climatic conditions prevailing, Nature "runs to thorns" when she means leaves; that these spines are a sign of a hard life, and not designed for defence at all.

At our high camps we should have been badly off had we depended on these living bosses of cuerno de cabra and yareta for fuel; for there was no thickness of wood in them, and they burned up at once. But the men dug up quite big dead roots and branches, which they said were of old cuerno de cabra. If so, "there were giants in those days."

Nearer Puente del Inca were other thorny bushes, much smaller than the acerillo; I think I saw but one that was thornless, and that looked rather like our broom.

Grasses.

Round the saline springs, and in them, grew, very luxuriantly, a rush-like grass of a deep rich green;

BOSS OF YARETA, SHOWING THE SPINES.

MEDICINAL PLANT GROWING HIGH UP IN THE ANDES.

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and outside this, where it was less wet, a gray-green grass whose leaves ended in veritable spikes (another spiny plant!).

But such verdant spots were exceedingly rare. The one grass that you could count on up to, say, nearly 12,000 feet was a coarse kind that was, at the time of our visit, yellow and dry as hay.

It grew very curiously. Even if my theory be wrong, at any rate the mode of growth is correctly described.

One saw round tufts of it; tufts with the centre dead; tufts with the centre filled with sand; larger circles with sand inside; and fragments of circles that would (completed) be several feet across. Looking at a hill-side on which it grew, one was struck with the resemblance of the grass circles to the coral islands which one has seen depicted in charts.

My theory is that, in that arid climate, the centre of a tuft died for lack of water, and that the outside gradually extended outward "searching" for water (so to speak), while the inside died away for lack of it, the outside ring having intercepted it. Thus, what would have been in the end, in a less arid soil and climate, a big clump of grass, had become merely a ring. In fact the clump grew, but its inside kept dying.

The result looked very curious.

What a fight this grass and the scrub had with the drifting sand! Bush after bush of scrub, and tuft after tuft of grass, succumbed.

Flowers and Small Plants.

A very remarkable plant was one that had a large white flower (perhaps more than an inch across) of a cup form. For the whole plant, leaves, stem, and all, was such a mass of fine spines that to touch it was like touching a nettle—save that there was no after-swelling. I secured a very good photograph of this that has made a splendid lantern-slide. Another plant had somewhat the form of a toadstool, it being built up of a number of very small green and purple leaves, that overlapped one another, into the form of a dome. [See illustration opposite p. 252.] This grew among the stones, and was not easy to distinguish; and it had very long tap-roots. An arriero told me that it was a "stomach-remedy"; another man that "an infusion of it was good for purifying the blood." A very common object was a big sort of pincushion of a flower (or community of flowers), some six inches or more across, that grew flat on the ground without visible stem and looked like a sea-anemone. The mass of little flowers that made it up were of a greenish white, and curious little budding communities occurred near the edges. The whole was neatly framed in a ring of radially-directed leaves.

All these grew up to a height above sea-level of 12,000 feet or so, as near as I can say. At greater heights, as 15,000 or 16,000 feet, I think I noticed mainly a plant growing close to the ground that had

a head rather like that of an artichoke, but much flatter. It was not unlike a house-leek, but the leaves were finer, and it was not fleshy.

In what appeared to be its more complete form it had a whitish flower, or family of flowers, in the centre, and the artichoke-like leaves framed this round.

Birds.

Birds were not plentiful; but still, up to the limit of the coarse grass or thereabout—say up to 12,000 feet above the sea—they were "there," though a party with shot-guns would have soon starved had they depended on them for food. Of water birds I saw two coots, two birds like sheldrake, and a few duck; but all these were, I should say, at under 9,000 feet above the sea. Higher up, and reaching, perhaps, 11,000 to 11,500 feet, were flights of a very pretty little dove, different from, and larger than, the very small dove of the plains, and highest of all were partridges and stone-grouse—as they seemed to be. When on the ground their shape was quite partridge-like or grouse-like; but they appeared to me to have a touch of the sandpiper style in their flight and to have unusually pointed wings. At about 10,000 feet I saw also some "*guanchos*," called "d'Orbigny's seed-snipe" in Hudson and Sclater's book.

There were, relatively speaking, plenty of small birds up near our high camps. One was very quaint. It was about the size of a robin, and was light brown above and gray below. It ran along in a humble and

stooping attitude, and then would suddenly stop and stand very erect, pretending to be a penguin, looking absurdly self-important. There were also small crested birds that looked like finches.

Near Puente del Inca I saw sometimes a bird about the size of a thrush with a long tail that was mostly white and showed up conspicuously during flight.

Of *condors* I saw just one, but that was only about 200 yards off. I told the arrieros that I had seen one, and they were incredulous; but directly I described it, they said at once that it was a condor. They are very common in some parts, Dr. Helbling told me, but here there was little or nothing for them to eat.

Animals, &c.

Three guanacos, some guanaco spoors, and the excreta of some kind of mouse were all the evidence of wild mammal life that we came across; and, of tame animals, only some mules.

I saw small lizards, a toad, some tadpoles (at about 8,200 feet), a tarantula of small size—none of these very high up; and at 12,000 feet or so flies, a sort of black wasp, and some quite uninteresting butterflies.

I remember, by the way, how a toad was once found near the camp fire, and how the arrieros sprang up and almost fell over backward in terror. They were about to push the poor thing into the fire with a pole, and were horrified when I took it up by a leg and put it away safely among the scrub.

CHAPTER XIV

NEAR PUENTE DEL INCA AND THE CUMBRE—ACROSS INTO CHILE; VALPARAISO AND SANTIAGO—RETURN TO SANTA ISABEL

I RETURNED then to Puente del Inca on February 28th, after just twenty-three days spent in the wilds. It certainly was very pleasant to get once more a bed, baths, and good food; and so I stayed on for some days.

Dr. Helbling went off again with an Englishman of about his own age to attempt to cross a big glacier region. The former was thirty-one hours on the ice alone, with very little food; he had to pass a night in an ice-hollow (as giving some shelter from the wind) and was obliged to stamp his feet all the time, as the cold was terrible. That is the sort of thing that he can do, and what I ought to have been able to stand in order to be an equally-matched comrade for him!

The other man turned back at the ice; but I believe he was out (also alone) for two nights—lost.

On March 2nd I had an interesting expedition with a party of other people, mostly German-

Argentines, up the valley of the Horcones, our objective being the base of Aconcagua. Quite early in our ride the little Laguna de los Horcones was reached; and the view of Aconcagua over it, with the reflection below, was very beautiful.

After a time we came across some earth-pillars, something like those of Euseigne in the Val d'Hérens. There had been a huge deposit of mixed earth and stones, fairly compact, and in this some harder masses of conglomerate. The rain acting on it had washed away much and had left some big blocks of the harder conglomerate perched on columns of the softer stuff which they had protected. In the pillars of Euseigne the columns are of silt and the crowns are blocks of real solid rock.

Further on the valley branched. The branch to our right (as we ascended the valley) was the shorter and steeper; that to the left was much longer, and I was told that would-be climbers of Aconcagua go up this latter. We went up the former, and, from the map, I imagine that we ascended more or less towards the north.

After a time we got on to the side of a dirty glacier that descends from Aconcagua; and, still on our mules, wound our way up and between vast moraines until we attained a height which Dr. Schiller (who is Professor of Mineralogy at La Plata) gave as 5,000 mètres, or some 16,400 feet above the sea.

The glacier here was covered with débris, and there were no penitentes on it; as I have noted

SO-CALLED "PENITENTES" (OF ROCK), NEAR PUENTE DEL INCA.

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already, I never saw penitentes on dirt-covered ice. Aconcagua rose sullenly above us, more or less to the north-west of us, I should say, partly shrouded in mist. Certainly *here* was not the way up; it was a face of rock and ice down which débris fell.

By the way, later on, when I was in Santiago, I came across an account of this expedition in a Chilian newspaper. Only a German gentleman present, and his niece and daughter, were mentioned, and no one would have gathered that mules were used. It was represented as a terrific ascent, and I feel pretty sure that some day we shall learn that "a German gentleman with two ladies ascended Aconcagua"! Ours was, in point of fact, merely a tiring mule expedition.

On March 4th I went off with a mule-man to visit the so-called "penitentes." These were pinnacles of rock (or conglomerate) sticking out of the screes, and had nothing to do with penitentes proper, save as resembling them in form. While up on a height photographing these I turned round and took a distant view of Aconcagua.

In order to reach the region of these "penitentes" we had come up a narrow gorge that was the mouth of a valley running into the main valley (*i.e.*, that of the River Mendoza) from the south; and we had mounted a small hill in order to get a better view of these rocks. We now descended into the upper part of our valley, and found it wide and open. And

here I came across another form of Andine desolation. Hitherto I had been in steep-sided valleys whose flanks were covered with slopes of loose stones, at the bottom of which huge boulders bordered the river-bed. But now I found myself in a region of gently rounded hills of smooth red soil, quite devoid of vegetation. One wondered why it was not all clothed with grass. It is the lack of water, I suppose, that is the cause. Nothing here suggested that we were in the giant Andes; all seemed so mild. Of course, big mountains were near; but to us, sunk in these gentle troughs, they were invisible, and very harmless-looking curves cut the skyline.

Lunch, or "breakfast," in these expeditions from Puente del Inca was a great institution. We had ribs of sheep roasted over the fire and eaten in the fingers; and my guide, the owner of the animals on which we rode, made maté with coffee instead of water, a decidedly good drink. This guide, Elias Bergara by name, was very Indian in type, but a nice fellow.

We took another way home, seeing more of these bare hills. Then we reached the heights that looked down on the hotel, from which there is a very fine view of Aconcagua; and we had a long and steep descent down a well-made zigzag path. I was on a horse this time, not a mule, and I was surprised to see how well and safely it went on this and on other occasions.

One more expedition I went, and this time with a friend as well as Elias Bergara. We went up on the north side of the valley of the Mendoza River and cut across into the "Valle de Panta." We soon got among the same sort of bare red slopes and rounded arêtes that I had seen the day before. But, at last, on reaching the top of such a ridge, a very different scene lay before us. The other side descended, steeply for the most part, into a deep stony hollow; and beyond this, seen broadside on, was a fine rock-ridge, nearly level, the culminating point of which, just opposite to us, was the "Cerro Santa Maria." It was the rock-face of this which Dr. Schiller had described to me as "a rock-wall 1,000 mètres (3,250 feet) high."

We made our way down and had lunch below. This view was a fine climax to the expedition, and came on us very suddenly.

That brought my stay at Puente del Inca to an end. But before I pass on, I must mention the enormous herds of cattle that appeared to be, at not very long intervals, streaming over from Argentina to Chile by road. I saw none come the other way It was a striking sight.

In 1909 the final tunnel of the Transandine Railway was not yet finished; the line being opened on the Argentine side as far as the station of Las Cuevas, above Puente del Inca, and running thence (for purposes of work only) up to the tunnel entrance

where the works were. The contract was, I heard, in English hands, and all the officials were English up there. Indeed, all along this line the English seemed to be in authority; even the Customs' official on the Chilian side at Los Andes was an Englishman (in plain clothes).

A young storekeeper had asked me to spend two nights at the works, and accordingly on March 6th I went up to Las Cuevas by train. My host proved to be ill, and so, somehow or another, I did not get to see the tunnel. But I was told that the boring was done by compressed air, and not by electric motor machines, though there was electric light; and further that all machines, both for the boring and the lighting, were worked by fuel, and not by water-power. The tunnel workers were mostly Chilians, and appeared to be a lawless lot; murders were, I was told, not infrequent on the road above, and officials carried revolvers.

From Las Cuevas a good coach-road ran over the pass called the "Cumbre" (or summit), and when I crossed (as indeed for a year later or more) the through journey was here completed by means of carriages and mules, the line being joined again at Caracoles station on the Chilian side.

So next day (Sunday, March 7th) I walked up to the top with my camera, taking an hour and a quarter, and was able to secure some photographs at leisure. There are fine views there; and there is a colossal bronze Christus set up in commemoration of the

settlement of the frontier dispute which had nearly led to war. It was intended as a symbol of peace.

The well-made road, and this emblem of Christianity and goodwill, made it difficult to believe that one was in a sense in the wilds. Yet I was told that my short expedition, unarmed, was very imprudent. Indeed, on my return journey from Chile, the mule-riders (who took short-cuts between the zigzags) came across the decomposed body of a murdered man ; and several other murders had been committed up there within the last year or so. I understood that the danger proceeds from the class who came over to work in the tunnel.

I had a good view down into the valley by which we were to descend to Chile next day ; and, turning the other way, I had opposite to me, over the Cuevas works, the huge Tolorsa, with a bit of Aconcagua showing over it to my left.

On Monday I cantered down to Las Cuevas station with one of my young hosts, who most kindly carried on his horse my somewhat heavy little portmanteau. There I was handed over to an English inspector, whose special business was looking after this connection, by road, between the two terminal stations.

Really the Company had very inconvenient arrangements!

In the first place I had not been able to book through to Puente del Inca from the important junction of Junin on the main line ; there proved to be no time to re-register at Mendoza, and trains

did not run every day; so that (but for bribery!) I had nearly been obliged to stay some two days at Mendoza.

Next, starting from Puente del Inca, which is the fashionable half-way mountain resort for Argentine tourists, it was impossible for me to book to Valparaiso or Santiago, nor was there time to re-register luggage on the journey. Finally, on return, it was impossible for me to book and register my luggage from Santiago to Junin; I had again to try to rebook at Mendoza.

At Las Cuevas there were a whole row of carriages, and also a large number of mules, waiting at the station; I was put into one of the former. I had no ticket for my luggage, and for my own right to travel I paid a guard. It was somewhat confusing. There were proper railway-guards, Argentines in khaki dress (agents of some tourist-companies), Englishmen in khaki costume also, and Englishmen in plain clothes —all in authority. As regards the ascent to the Cumbre, the riders on mules had the best of it. But, for the descent on the other side, we in carriages were certainly better off; for we swept down smoothly in our awning-covered carriages, while they jolted down at a hurried trot [to which no one could rise] in the sun and enveloped in a cloud of dust. The carriages each held one beside the driver and four inside, and were pulled by four horses abreast. The illustration shows our descent. The view back towards the frontier ridge, over the Chilian end of the tunnel,

THE ROAD DOWN INTO CHILE, AND THE CERRO DE LOS LEONES: FROM THE CUMBRE.

DRIVING DOWN INTO CHILE.

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which we got at a corner of the road as we neared Caracoles, was very fine.

Getting into the train at Caracoles, we at first had a winding descent of slight gradient over a wide region that was very desolate. But when we had reached the lip of this, the descent became very steep. Indeed, the engineering of the railroad on the Chilian side must have been a serious matter. On the Argentine side it was a relatively gentle ascent up a long valley; there appeared to be no special difficulties, though there was certainly some lack of solidity in the mountain-sides traversed. But here it was another matter. I have never been in such grand rock scenery; grandeur was the keynote, not desolation or destruction, as on the other side, where the mountains seemed to be in visible dissolution, giving a certain rawness to the views. There were magnificent crags, and these looked old and weathered and gray; and of débris there was no more than there should be. Gripped for the most part by scrub, plants, and lichen, these stone-slopes fell into place as part of the "eternal hills"; and the line, with its frequent short tunnels, gave one most impressive and even startling views.

We had left Caracoles at about 2.30 p.m. At Portillo, which had been for some time the terminus, I got a photograph of the picturesque Laguna del Inca, which is supposed to be bottomless (!). About 5 p.m., below Funcal, I began to notice trees and grass on the valley-bottom. A curious feature of the

lower part of this mountain valley was the huge rod-like cactus, plants of which would be higher than a man on horseback, mixed with trees of a European aspect. Indeed, the fruit markets showed that the climate is far from being tropical; vines, pear-trees, and peach-trees grow side by side with this big cactus, the prickly-pear, and the spiny sort of palm-trees.

A very striking place on the way down was the cañon called the "Salto del Soldado" (or soldier's leap). I should say that the river of the valley that we followed, which has cut this cañon, is called the "Rio Aconcagua."

Further down the scenery took the character with which I became familiar when I travelled between Valparaiso and Santiago, and between Santiago and Los Andes. The hills were of extraordinary aridity, practically bare of all vegetation save cacti and thorny trees, and sandy in character. But wherever man had settled on the valley-bottoms, and had seen to irrigation, the vegetation was luxuriant. I remember, too, the colour; the crimson flowers of the big cactus, a shrub that was one mass of crimson bloom, and a parasitic plant that added a dash of splendid crimson to many trees.

I had worry about my baggage at Los Andes, and at Valparaiso could not get it out (having no ticket for it) for some two days or so; but at this last-named place I was very pleased with the most comfortable and moderate Hotel Royal, where I

met with much more courtesy and attention than (as far as my experience goes) is usual in Argentina. Indeed, I found the Chilians friendlier, altogether; in Chile I felt more at home, more as I do in Switzerland.

Fortunately I had with me in hand-bags my camera and plates, and enough clothes to get along with, so the lack of my heavier luggage did not hamper me much.

Next day, March 9th, I went out to photograph and to get my first impressions of Valparaiso.

Of the buildings I cannot say much. The town had not yet recovered from the effects of the great earthquake of 1906 (I think it was), and everywhere one saw hoardings, temporary buildings, and scaffolding.

The climate seemed delightful. I have never felt so fresh and well in any town, or even in any place, as I did in Valparaiso; not even in mountain hotels (when not climbing). I was told that a cold Antarctic current sweeps the coast, and that this modifies the climate, as does, in the opposite sense, the Gulf Stream on our own west coast. Distinctly it is a climate for Englishmen. The shipping and the evident activities of shipping business, as also the presence of a warship or two in the harbour, made the place seem to me, after my seventeen years in Devonport, quite home-like. And everywhere, in knots at street corners and on the pavement, I saw Englishmen of

a good stamp and prosperous-looking—business men they appeared to be ; Valparaiso seemed full of them.

I had told the Acting-Consul that I wanted to see the Naval Schools. So he sent me to the officer in command of the port ; and this latter, a most courteous gentleman who spoke English well, sent me to another (also very courteous, also English-speaking) at the Naval Engineering College. I was finally handed over to a Scotsman who was an officer there. I noticed that the cadets were being taught English ; and the statement made to me by my Chilian acquaintances in the train, that "Chilians liked the English, and all Chilian naval officers spoke English," seemed justified as far as my experiences went. This college was in temporary buildings, and of course seemed small after Keyham, the Chilian fleet being small. But it looked thoroughly practical.

I was given to understand that the Chilian authorities had considered our new naval scheme, but had decided not to follow us in trying to "teach everybody everything ;" their engineer officers remain specialists, as ours were until the "New Naval Scheme of Education" took effect. As to the Naval Schools for the executive and other branches, they were under repair, and I did not see them.

I am told that the Araucanian Indians, the chief native race in Chile, were a fine and warlike people who gave the Spaniards much trouble. From this it resulted that, for the most part, the Spaniards who colonised Chile were also of the more warlike and

A GLIMPSE INTO VALPARAISO HARBOUR, AT EVENING.

STREET SCENE IN VALPARAISO.

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adventurous sort; and hence, that there grew up a race of half-breeds of a bold and sturdy nature. Certainly the porter, or carter, race that I saw everywhere—they would naturally be in much demand at a port—were men of fine physique and bold faces. These men had usually the feet and part of the leg bare, and wore a spur on the bare left foot. This can just be made out in the illustration. I saw them carrying burdens and loading and unloading vans, and also riding one of the two horses that drew the commonest sort of cart.

Gaily coloured ponchos were much worn, even by men of higher classes. And a horseman in the so-called *huaso* dress—which I understood meant the dress of an estanciero or ranchero—with his broad-brimmed straw hat, gay poncho, leather gaiters up to his thighs furnished with silver fastenings, and lazo attached to the saddle, was a very picturesque object in the streets.

While speaking of dress I must not omit to say that in Valparaiso and Santiago I saw everywhere women in black dress with a black mantilla (as I suppose it would be called) over the head; though there were others, of higher class or richer I presume, in ordinary dress with hats, &c. I learned from an elderly woman, in such dress, who sat next to me in the train, that it had nothing to do with mourning or with fasts of the Church; she said it was "for economy mainly." I suppose this fashion is of Spanish origin.

It certainly gave a "national" appearance to the people which was lacking in Buenos Aires.

When one got away from the more crowded main streets, fruit vendors and wayside fruit-stalls were very noticeable. Seeing how arid the country looks, and yet how cheap fruit is, I concluded that the soil must be very fertile when watered.

I saw scavengers stop to eat huge water-melons, and I doubt whether any are so poor that they do not get fruit; for, if it were so cheap when sold in the daytime, to what depths of cheapness must it not have descended at the end of the day?

I visited the Playa-ancha heights, on which were public grounds. These must be a great resource for the people of Valparaiso; they can easily get into this cooler air and enjoy the wider views, since trams run all the way up.

I went also by tram along the coast to Miramar, and found there a good beach and plenty of bathing accommodation. There, I noticed, the bathing was not "mixed."

Thence I went on to Viña del Mar, to which the trams run also. This stands back away from the sea. It is *the* fashionable suburb of Valparaiso, and there are the villas of the well-to-do business men.

The public gardens there are small, but the trees and shrubs of the private grounds fill the place with beautiful vegetation. But of Valparaiso it is the harbour and the fresh air that remain in my memory as the attractions.

One very remarkable thing that I observed both in Valparaiso and Santiago I must note; it speaks well for the manners of the people. There were many women-conductors (not drivers) of the electric trams, and some quite young and pretty. There was not a sign of bad behaviour towards them, nor freedom in look or speech; the people treated them as people treat ticket-collectors on our trains.

On March 12th I set off for Santiago, the capital. The train turned inland about Viña del Mar, up a valley of sand, with hills on each side that looked like big sand-dunes. Nearly all the way to Santiago hills of this kind, sometimes big enough to be called mountains, of sand or sandstone as it seemed to me, were *the* feature of the scenery.

Up to some distance from Viña del Mar I saw poplars, sauces, and vineyards on the valley-bottom, the poplars brilliant with, and the sauces splashed with, the crimson blossom of the parasitic plant already mentioned; and as we neared Santiago I saw more and more poplars. But, in between, we passed through scenery of which the extraordinary aridity has left a strong impression on me. The soil was absolutely bare and dry, and the only natural vegetation appeared to be a tree or big bush somewhat resembling our hawthorn in shape, but of slenderer branches and narrower leaves, and the rod-like giant cactus. There were bare earth flats that should have been fields, and bare earth slopes that

should have been verdant hill-sides. The land cried aloud for water! The crimson-flowered parasite on the small trees somewhat relieved their bare and stunted look, but nothing could make up for the lack of a carpet of green herbage.

Some four hours after leaving Valparaiso we descended from the hills that we had crossed on to a level plain or flat valley-bottom in which Santiago is situated. After the barrenness of the hills, even the poor herbage of this plain, helped out by the poplars planted, made it look almost green and fertile. But when I left Santiago, where I had visited several beautiful and well-watered parks, I saw in what a barren flat the capital is really situated. Evidently it was under water at some time not very remote geologically; the soil had the aspect of a dried mire, and bore very poor and unattractive-looking pasture.

But they have made a very striking city of Santiago. It is well laid out, with good streets and one central avenida of extraordinary width, and has in it beautiful parks and gardens. In these, thanks to continual watering, trees of all sorts—palms, eucalyptus, pines, and others—thrive, and there is even excellent turf.

While I was there the weather was hazy, and the ring of hills or mountains about the city looked very beautiful.

I got, from the owner of the hotel, a list of places to see (and to photograph), and set to work next

IN THE MERCADO DE LAS VEGAS, SANTIAGO.

SAME MARKET. ZAPALLOS AND SANDÍAS.

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day. I first visited the little Parque Forestal. I found it beautiful, but not large enough to hide from view the houses round it.

It was no use photographing inside a building, so I did not spend much time in the great Mercado Central (central market). I went on soon to an outdoor market, the Mercado de las Vegas, of less pretentious character, where little but pumpkins and water-melons was to be seen.

It was an interesting and picturesque scene.

I found the people very good-natured; here, as at Valparaiso, no one was too inquisitive, and no one thought me intrusive. I *was* mistaken for a professional once, and asked to take a photograph of a man with his girl; but that was not surprising in a country where (I should say) hobbies are rare. More than once the people posed for me most obligingly. I went next to the Cerro de Santo Lucia. This is a wonderful example of the landscape-gardener's art and of money spent for public recreation. How much is natural and how much artificial it was difficult to judge directly; but, having regard to the general aridity observed where man had not worked, I should say that there was nothing to start with but a bare rocky hill. Now, there are on it winding roads, picturesque buildings, fine trees, palms and aloes, rockeries, water-pools, and falling water; and, crowning it, reached by steps hewn in rock, a platform commanding a wide view.

Artificial the place certainly is; but equally certainly,

it is beautiful and a place of refreshment of great value for the people of Santiago.

Next day I went to see the Quinta Normal. Here I found beautiful grounds with green turf, forest trees, palms, and shrubs; and standing in them was a very fine building that proved to be a museum, and also a smaller one that was a picture gallery.

All this part was well looked after; constant watering is the essential thing.

There were other regions belonging to the Quinta Normal: vineyards, a football ground, small zoological gardens, and a School of Agriculture with gardens attached. They do these public matters very well in Santiago.

Quite in the middle of the bustle of the city lies the square called the Plaza de Armas; and if you retreat into the garden you can get a very fine picture—the Cathedral seen through the palm-trees. A photograph of this, one of the very many taken in Santiago, is reproduced here. Last of all I went to the large Parque de Cousiño. The authorities do not attempt to fight the aridity all over this. There are drives shaded by eucalyptus, and a large oval—intended for races, I supposed—that are all parched and dusty. But south of these lies the part especially intended for the recreation of the people, and that is perfect for the purpose. The only flaw is the unsightliness of electric light standards and wires; and these are needed if people are to go there at night. There is beautiful turf—watered all day

PLAZA DE ARMAS, AND CATHEDRAL, SANTIAGO.

IN THE PARQUE COUSIÑO, SANTIAGO.

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long, it seemed to me!—and the trees and shrubs that I had so admired elsewhere. But the great attraction is an artificial lake fringed with shrubs and giant grasses and with many strange birds about it, both swimmers and waders. There is an island with llamas on it,—I think the largest sort—picturesque summer-houses, and boats. I said, with intention, "perfect for the purpose"; for the people need these boats and summer-houses, though they undoubtedly mar the more natural beauty of the water and vegetation. It was all most restful; shade, freshness, and absence of dust and noise reigned. On the way back I visited the great Avenida de las Delicias. It is a wonderful street! Where I struck it I found, first, a roadway wide enough for up and down traffic of carriages on one side and up and down trams on the other; then a wide shaded avenue for foot-passengers, with a narrower one by the side of it; then a belt of garden with flowers and fountains; and lastly, a second road and tramway like the first. This meant an enormous breadth, and no photograph could take it in or do justice to it.

On Monday, March 15th, I set off to re-cross the Andes and to return to Santa Isabel, that now seemed so far away on the Argentine plains; and, as I went home by the same route as that by which I came, I will give no detailed account of my journey.

Chile is a narrow strip of territory of enormous length, and my visit to Valparaiso and Santiago

hardly seems to justify me in giving my impressions. Still, if I point out first what a small portion I actually saw of the whole country, it may be of some interest if I say what struck me most about Chile as compared with Argentina.

Firstly, after the vast formless plains of Argentina, Chile seemed to me attractive through possessing shape and character. You might be dropped almost anywhere in the central pampas of Argentina, and it would look all the same; it would be like being dropped anywhere at sea. But in Chile evidently each part had its individuality; and I felt that while you might very easily acquire quite a passionate love for "life in the Pampas," in Chile you would rather get a love for the country itself as your home and adopted fatherland. I think patriotism would thrive more in Chile than in Argentina; just as love for a person is more easily entertained than love for a formless spirit.

Then, the population in Chile, so far as I saw it, seemed more homogeneous, more of a nation; while in Argentina, which appeared to me to be rather a vast region for "getting on" in than a country in the sense that France is a country, the population seemed to be as yet not a nation, but a mixture of unblended nationalities.

Nevertheless, when (to pass over my long and interesting return journey) I came once more into the fertile plains that were such a contrast to the aridity that I had found in Chile, I did feel it restful!

The alfalfa had recovered from the locusts, and the quiet spread of green plain refreshed the eye and expanded the mind. Certainly, for all its monotony, I felt the charm of "the camp."

It was about 2 p.m. on Wednesday, March 17th, that I reached Junin, and the next train for Villa Cañas started at 12.30 p.m. next day! A small boy, half negro, at the station suggested the "Fonda Roma" as a suitable hotel, so I went there, but with many doubts. It looked *very* native! I was rather dismayed when I was shown a room with five beds in it; but I finally got one with only two. After all the place was not so bad. I had my meals in an open veranda looking into the patio—where was a fountain with goldfish in it; and, greatest wonder of all, there was a place where I could stand in a zinc bath and induce water to fall over me from a rose up above—really and actually a *bath-room* in a camp fonda that looked like any other!

At 2 a.m. I was knocked up to admit another man to the other bed in my room. I believe I ought to have refused, as such things as robbery can occur in these fondas; but he turned out to be quite respectable.

On Thursday, March 18th, came the last stage of my long journey home. I went on by train to Villa Cañas, and there was met by good Gomez (the man who looked like a murderer when he was being photographed, but who had a kindly smile latent), one of the "peones de confianza." It was

pleasant to find how delighted he was to see me again. This cordiality surprised and pleased me the more, as my relations with the capataz and peons of better standing had not been at all intimate, owing to two unfavourable conditions; firstly, they had no nice clean room or house in which I could go to see them, and secondly they seemed singularly unable to adapt their talk to a foreigner who does not easily catch what they say. You ask them to "repeat that more slowly," and they merely shrug their shoulders in despair, exclaiming "¡No comprienende V.!" ("You don't understand!"). Even better-class Argentines were very inferior to Swiss peasants in this; about the highest classes I practically know nothing.

At the estancia I found that the alfalfa, which I had left brown and eaten to the ground by the locusts, had so entirely recovered that they had been cutting more hay. [The willow-trees had sprouted again to some extent, but the harm done by the locusts eating the bark was irreparable, and I believe that soon my brother will have nothing but paraiso-trees in his monte.]

I now set to work to develop plates. I had so much to do that I sent my sixty films to Buenos Aires to be developed, and they were done only moderately well. The one hundred and twenty plates (!) I kept to do myself; and very hard work it was. These hundred and eighty negatives, be it noted, represented only the photographic activities of the six weeks of

my absence from the estancia. My total work for the whole time spent in South America was something appalling; I developed 800 or 900 plates myself.

Very curious it was to see the past scenes of the last six weeks coming out under my eyes, there in the little dark-room at Santa Isabel.

So ended my expedition to the Andes and Chile. All things considered, I felt—and feel even more strongly now, at a greater distance of time—that I saw and did a good deal. No plans had been made beforehand, and I had been ignorant as to equipment. Hence I was bound to miss much.

Besides memories, some very solid results remain; for I have the hundred and eighty negatives, and out of these have had made a large number of very good lantern-slides.

CHAPTER XV

AN ESTANCIA IN THE SANDY PROVINCE OF SAN LUIS—A MODERN ESTANCIA IN THE PROVINCE OF BUENOS AIRES—BACK TO ENGLAND—FINAL REFLECTIONS

I WAS apt to forget how vast was this Argentine Republic, and how varied its territory; and to picture it all as originally a huge treeless alluvial plain, thickly carpeted with coarse grasses and dotted with shallow lagunas. That was the type of country where I had spent my time during my visits, and did in fact represent a vast area. And although I knew that this type, sown with crops or alfalfa, has been and still is the main source of wealth of Argentina, and most characteristic of it, still I was glad to have an opportunity of seeing another sort of camp that I shall now describe. Some seven years before, my brother had bought a little estate (only some 35 square miles!) in the province of San Luis, and had been working it through a manager. This property, called by him "El Àguila" after a big "mèdano" (sand-dune) lying in it, he visited every year; and now I was to go with him.

On April 6th we put out to sea; that is, we started

from our port (the station of Melincué), and for a long way were accompanied by the familiar unchanging prospect—the flat alfalfa-covered plains bounded by the sharp-cut circle of the horizon. I suppose that the change took place more or less gradually; but I did not take stock of it until, on the second day (for we slept at Rufino en route) we neared the station of Buena Esperanza.

Instead of flat, fertile, and treeless alluvial soil, we now had deep sand; and undulations and hillocks of sand broke the general level. The natural vegetation seemed poor and scant; there was much of the "white weed" (yuyo blanco), "black rush" (junco negro), and pampa-grass (stunted in these later days) to be seen, with sand showing up in between; so that I wondered what the cattle could have found to eat before alfalfa was sown. An abundance of trees, scattered or in clumps, was a new and pleasant feature. My brother had spoken of these in most enthusiastic terms; but I must confess that to me, brought up with European standards, his "forests" were disappointing. The trees were stunted, like big hawthorn-trees, and the foliage was inconspicuous and gray-green; the most common tree, the chañar, had the same kind of peeling bark as the eucalyptus, and this gave it to English eyes an unhealthy appearance.

In Santa Fé the roads were of dark earth that gave easy, though dusty, travelling in dry weather, and became nearly impassable in places when much rain had fallen.

Here, the reverse held good. The roads were of sand, and were terribly heavy in time of drought, while rain made them far more compact and easier to traverse. At the present time there had been a drought, and the roads were in consequence very bad.

The manager, my brother, and I (with a little baggage) were in a light two-wheeled trap, and to pull this it took four good horses, with a relay of four more at half distance. In Santa Fé, two horses could have taken us the whole way in any but very wet weather. And the riding-horse of one of the peons who came with the carriage died the same evening of pure exhaustion! The further we got from the station the more park-like did the country become. But how one missed the bracken, the grass, the oaks and elms and beeches, of our parks! Yuyo blanco, junco negro, and chañars formed a poor substitute; and, as already noticed, the pampa-grass is now mostly in a stunted condition, on its way to disappearance.

Alas that the lagunas are vanishing here also! Only seven years before (to take one example) there was a laguna that *looked* to my brother "bottomless," and on which he counted some five hundred black-necked swans, beside innumerable other water-birds. This is now dry; a crust of salts covers the bottom, and the swans are gone. In the illustration, reproduced from my photograph of this laguna, the white crust of salts can be seen, and the rushes are the junco negro spoken of above.

After but seven short years, of all the lagunas that were on the estate when he bought it only one remained that was still clear and fairly full; and even in this case, a second laguna that was more or less linked with it had (practically) dried up. The others, when I saw them, were either dried up or on the way to this end. And in a shrinking laguna the water appears to become green and foul, and there is a wide muddy margin crusted with salt.

Still, when all is said, the glory of the morning and evening sun remains. And if even the suburbs of Melincué can be transformed and idealised by it, how much more this undulating camp with its trees and huge tufts of dark rush! It was very beautiful then. I found the present house where the manager lives a very modest little building: the walls were of mud (see p. 109), whitewashed, and the roof of corrugated iron.

But, with a view to a larger estancia sometime in the future, a proper site had been left, a good garden made, and a shaded path round a small paddock, as well as an avenue of poplars up which the future carriage-drive was to come, had been sketched out as far as trees went.

I found that the conditions of soil here were very different from those obtaining at Santa Isabel. There, all the land was very fertile save in the hollows left by old lagunas, and in these latter alfalfa would not grow. The land in these hollows was light coloured (tierra blanca), a mire in wet weather and a

hard cake in dry; while the higher and good land was rich, dark, loose alluvial soil. And further, it took about four years of ploughing and sowing with crops before the good land was ready for alfalfa; for an attempt to get alfalfa earlier than this would result in a too rapid reversion to the old native grasses.

Here, it was just in the hollows that the alfalfa would grow, and not on the higher parts; though it all looked much the same, all appearing to be composed of sand, save that the lower-lying land was rather firmer. I imagine that, here, it is merely a question of the depth to which the alfalfa-roots must go in order to find water; while in Santa Fé there was a real difference in the soil on higher and lower land respectively.

Again comparing, no colonists come (as yet) to these sandy camps; so the owner has to plough all the suitable land and to sow alfalfa himself, training the natives (the gaucho class) to this new kind of work. Thus there are no preliminary crops; alfalfa is sown direct, and it holds its own.

By the way, I could not but wonder what will be the fate of these sandy camps as the sinking of the water-level proceeds. In the richer alluvial soil moisture is retained, though the actual well-level may be 12 or 14 yards below the surface. But here, with the well-level only some two or three yards down in the hollows, the sand seems to get dry very soon, and the roots of the alfalfa have (I should say) to reach down nearly as far as the actual water-level. What will

happen when this sinks further? Perhaps the answer to this question is that it is possible, or even probable, that when the alfalfa has established itself well in the hollows, and grasses have been found that will grow on the sand-dunes, the land will hold water better; for, not only will there be a network of roots, but also the soil itself will in time become more disintegrated, and therefore less porous, so that the capillary action will be greater.

Not unnaturally, the main subject of my investigations, during my short stay, was the médanos (or sand-dunes), of which I had heard much. Some of these are bound by weeds, but some (médanos vivos, or living sand-dunes) are always on the drift and advance over the alfalfa. And the stocking of the camp has added to the trouble. For wherever the cattle collect, round the wells or under shade of the trees,[1] the earth is laid bare and the mischief begins; the more, as the animals actually paw up the sand and throw it over themselves as a protection against the flies. As yet no grass has been found that can be sown with anything like certainty that it will grow, strike roots, and bind this loose sand. The wind plays queer tricks. One big médano, that called El Àguila, was mostly tied down by weeds. But some eddy in the wind had kept a central hollow raw, and sand blew unceasingly out of this through a gap and advanced over the alfalfa. There used to be a pool

[1] So important, indeed, is this action of the cattle on the camp that the manager wished to cut down all the trees!

in the hollow which kept the sand somewhat damper and less obedient to the wind; but the water had dried up, and only a clump of rather depressed-looking reeds witnessed to its former presence.

I may here mention the fact that near all the big médanos that I saw were lagunas, full, drying, or dried; so that one was forced to conclude that the mounds of sand had been formed by the wind scooping out hollows, rather than by a general scouring of the surface of the camp.

I went to see the one laguna on the estate that preserved its original beauty—the Petacas laguna. Here I found water about as clear as that of our Midland rivers, and abundance of reeds round the margin. The usual médanos by the side were clothed with trees, and the whole was beautiful—very beautiful and peaceful towards evening. I saw on it two black-necked swans and innumerable duck and coots, and two stilted plovers waded on the margin. Not far off I found some exceedingly stunted specimens of prickly-pear, only a few inches high; but I do not know how they came there.

My last expedition was the most interesting. It was to the big Hortensia laguna and médanos, which lay just outside the boundaries of my brother's property. The laguna was large and the rushes and pampa-grass around it very picturesque; "a very likely place for pumas," my brother said, and he had seen a good deal of these beasts in old days.

A DRIED-UP LAGUNA, WITH SALINE DEPOSIT, IN THE PROVINCE OF S. LUIS.

THE HORTENSIA MÉDANOS AND LAGUNA, IN THE SAME PART.

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The médanos were on a very fine scale; they were rippled all over, and among them were eddy-hollows, just like those found where wind acts on the light winter snow in the Alps; only over-hangs (or cornices) were lacking to complete the resemblance.

Here were found many good arrow-heads—(probably "scrapers" too, only the finders were not well up in stone implements)—made of flint, fragments of pottery, and abundance of bones of animals, especially skulls of the "cuis" (if that be the spelling) or little guinea-pig of Argentina. This must have been a favourite camping-ground of the Indians.

Of other things that I noticed here in this sandy camp, I will mention a few. The chemango, or carrion hawk, so plentiful at Santa Isabel, was scarce here, but larger hawks abounded and were very tame. Only the little "piche" appeared to represent the armadillos.

A curious pest was a plant called "roseta." Its seeds, about the size of small peas, were covered with spikes of extraordinary hardness; they would (at any rate partially) penetrate, and stick to, leather topboots. At first I knelt down to focus my camera, but this was too painful. Then I squatted; and when, on one occasion, I overbalanced and fell backward, these burrs rushed at me and stabbed me all over. *Any* strength of language would have been—I hope, indeed, it was—excusable!

Another curious thing that I noticed was the following: I saw a good many patches of short alfalfa (where it had been eaten down close to the ground) covered with some shiny white stuff that suggested a parasitic vegetable growth. But it turned out to be the web of a small spider that could be seen in large numbers on the ground.

And, speaking of alfalfa, I may say that near Buena Esperanza I saw large tracts of this that had been attacked by some caterpillar or insect, with the result that little was left but the stems. I saw nothing in the rich alluvial camp in Santa Fé so suggestive of there being other enemies of alfalfa than the locusts.

One more word in review. Sandy and weedy and desolate as this type of camp looks, there must be much fertility in it, for it grows alfalfa well when this has once taken root, and the garden of the estancia showed a most luxuriant growth of pumpkins and melons, as well as of the tall canes and other plants.

On June 9, 1909, I left my brother's hospitable estancia in Santa Fé and began to make my way home.

I first paid a visit of a week to an estancia near Villegas, in the province of Buenos Aires. And here I saw camp of again somewhat different quality, and also was much interested to see how, in various ways, a quite modern estancia may differ from one

that was started years ago and in which, quite naturally, the traditions of the old pioneering times still have their influence.

First, as regards the nature of the camp. Here it appeared to me to lie, in character, somewhere between the rich black soil of Santa Isabel and the sand of El Àguila. There was some sand, and many ridges and mounds evidently once formed by wind; but there was no trouble, to speak of, from "médanos vivos," and walking was not laborious as it was in San Luis. Colonists, too, find it good for crops and take up holdings gladly. I learned that it answered to plough the soil and sow it with alfalfa direct; and, though part of the estate had been converted through colonists as at Santa Isabel, the manager did a lot of the conversion in this more direct manner, having employed at one time as many as thirteen of Ransome's double-furrow "Colonial" ploughs.

I saw, therefore, that now there is plenty of camp where the estancieros are independent of the Italian colonists; but none the less is it true that, in the main, the prosperity of the country has been due to these industrious agricultural immigrants. It has been their work that such conditions now obtain that an estanciero can, on suitable camp, work independently of them; for they, broadly speaking, brought about, even though indirectly, the rapid spread of alfalfa, of improved stock, and of the railway systems.[1]

[1] I may be rating too highly the work of the colonists.

I could not but be struck with a certain contrast that existed between this modern estancia and those of older type both as regards the greater comfort of the homestead and as regards the improvement in the peon class. The former is evidently merely a matter of outlay. And since a modern property with its alfalfa paddocks and improved stock will bring in perhaps ten or fifteen times as much income as would a property of the same size in the days of native grasses and native stock, the owner can afford to spend money in making himself thoroughly comfortable. As regards the improvement in the peon class, I have already said enough in Chapter IV. I will only add that a visit to such an estancia as this leaves one with the impression that the old gaucho class is being slowly converted into something like a decently housed European peasantry of the farm labourer and shepherd sort, though the nature of the stock work preserves much of its old characteristics.

. . . . . .

Save for a stay at Buenos Aires, the experiences of which I have combined with those of my visit to that city in September and have given already, this was the end of my second stay in Argentina.

My departure from Buenos Aires was rather dismal. On June 26th I drove down to the South dock, and was soon waiting there with my baggage for a tender that was to take me on board the " tramp " on which I had secured my berth.

The region where I found myself was dreary, if not

slum-like, in character; the weather cold and the sky clouded; and there was in my mind just that amount of uncertainty as to whether time and place were right that gives a certain degree of uneasiness and even of depression when one does not know the language of a country well on its conversational side. However, after some three-quarters of an hour a dirty little tug turned up. The descent to it was down steep stone steps, and I watched my heavy case, that contained, among other things, some eight hundred to nine hundred negatives, with much anxiety as it was half carried, half slid, down to the water's edge.

The "tramp" was still in the "Riachuello" (a creek or inlet) taking in frozen meat; but next day we started, and Buenos Aires soon faded behind us.

Of our voyage back, I need not say much. We started on June 27th, and on July 8th, early, passed the strangely outlined island of Fernando Noronha. On July 16th we found yellow sand on board, blown over from Africa across some two hundred miles of sea. Teneriffe was sighted on July 18th; and later we landed at Las Palmas. Finisterre lighthouse was seen on July 22nd, and on July 24th we began to meet with our own warships engaged in autumn manœuvres. Once more I was in home waters; and again I felt, as I have so often felt in the mountains in Switzerland, that "Cœlum, non animum, mutant qui trans mare currunt" is *not* true. The familiar surroundings and the sight of English men-of-war (among which I had spent seventeen years at Devonport) so

affected me that I could hardly believe that I had ever photographed locusts, or been mobbed by Argentine bullocks in an alfalfa paddock, sat at a camp-fire in the Andes with the constellations standing on their heads before me, or wandered among penitentes.

In squally and hazy weather we passed up the coast of England, making for Newcastle-on-Tyne; and there we landed on July 26th, after a voyage of about thirty days.

. . . . . .

And what were my final reflections?

Well, one thing I now feel strongly is that, in attempting to reproduce them, I must not allow my own personal unsuitability to a new country such as Argentina to colour these concluding remarks.

A middle-aged man, brought up in an old country and nourished on an old literature, of necessity prefers the old world. In spite of its material poverty, so widely spread, it seems to him rich in all that is immaterial—in thoughts, ideals, aspirations; in spite of its overcrowding and limitations of space for the body, it seems to him to offer, for the mind, spacious palaces of ancient splendour such as Tennyson dreamed of; and in spite of, or rather perhaps because of, its sorrows and anxieties, it seems to him to afford much that should nourish the soul and tend to ennoble the character. Necessarily, in a new country, the atmosphere, the interests, and the aims are more material.

Argentina is a land for the young and the enter-

prising—for those who wish to "get on." For such it is indeed a land of promise.

I do not think that there is any other land, certainly not among our colonies or our dominions, which offers to energetic Englishmen,—(as explained already on p. 80, I do not here refer to the ordinary "emigrant class" of English)—who are still young enough to adapt themselves, such wonderful opportunities.

Professional men, such as engineers, if only they have suitable introductions and so can get a start, will find interesting and highly-paid work. Men with capital, if they "know their way about," can find investments giving 10 per cent. interest; or, if they wait and learn the country, they may still be able to buy land that will in a few years' time increase in value many-fold. And lastly, but in my opinion this takes the front rank in the openings to be found in Argentina, if a man go out quite young and be prepared to work hard, he may, without any help from capital, force his way up through a mayor-domoship to a managership, and finally become a wealthy estanciero on his own account.

. . . . . .

That, gentle reader, is what I have to relate concerning Argentina—that huge, nearly empty land, whose future yet lies in the lap of the gods.

Of its material prosperity there is no doubt; for its national greatness we must hope—it is hardly welded into a nation yet.

APPENDICES

APPENDIX I

SOME ACCOUNT OF THE GEOGRAPHY AND HISTORY OF ARGENTINA, WITH STATISTICS INDICATING ITS PRESENT CONDITION

I HAD not intended to give any history of Argentina, or any statistics relating to it, in this purely personal narrative. But, on second thoughts, it seemed to me that it might be well to put within easy reach of my readers some general account, however incomplete and imperfect, of this Republic. For, huge though it be, it is little more than a name to the majority of Englishmen.

With this object in view I have dived into various books—the *British Encyclopædia* ("*B.E.*") of 1910, *Chambers's Encyclopædia*, Keane's "*Central and South America*," Dawson's "*South American Republics*," the *Supplement to the Times* of December, 1909 ("*T.*"), the *Statesman's Year-Book* of 1910 ("*S. Y.B.*"), the *Argentine Year-book* of 1909 ("*A. Y.B.*"), *Whitaker's Almanack* of 1910, and three huge volumes of the *Censo Nacional* of 1908 ("*C.N.*"), kindly lent to me by Messrs. Neild, Crane & Co., of River Plate House, London, E.C.

I must confess that I was dismayed to find how impossible it seems to be to feel sure of any *numbers* quoted being right.

Could the population of the city of La Plata be about 70,000 in 1899 (*Keane*), 45,000 in 1900 (*B.E.*), and 80,000 in 1908 (*S. Y.B.*)?

Can the area of land under vine-culture be both about 39,000 hectares (*A. Y.B.*), and also 122,000 hectares (*C.N.* and *T.*) in about 1908?

Can the number of sheep be 75,600,000 in 1907 (*A. Y.B.*, p. 166), 67,000,000 in 1908 (*C.N.*), and 120,000,000 in about 1909 (*A. Y.B.*, p. 33)?

In truth, the more I studied these various sources of information, the less confidence I felt in any figures other than those given in the text as extracts from the estancia books.

I. **Geography.**—All authorities seem to agree in considering the characteristic geographical feature of the Argentine Republic to be its vast plains. We read of these plains as occupying perhaps three-quarters of the whole territory; or again, that, except for the Andine foot-hills and some insignificant patches here and there, Argentina is one vast level. *Dawson* describes them as extending for 2,000 miles from north to south and as being about 500 miles wide. In the north, the region of the Gran Chaco, there are large tracts covered with forests and as yet unsettled—inhabited only by a scattered population of Indians; and in Patagonia, in the south, there are great areas covered with shingle and at present waste. But there is a vast central part, flat, treeless (or nearly treeless), and covered with deep alluvial soil—the region that was until lately a sea of native grasses and is now being covered with grain-crops and alfalfa. It is this part of the plains, the alluvial, treeless, and fertile pampas, that is *par excellence* the Argentina with which the world is at present concerned; the Argentina that has been, is being, and will be developed; the theatre of progress and the source of wealth. In the future, the Gran Chaco to the north and Patagonia to the south may have their turn; but their time has hardly come yet.

Whether the area be 1,212,000 or 1,136,000 square miles, and whether 400,000 or 600,000 square miles be suitable for crops and alfalfa (my authorities are not in complete agreement), clearly Argentina is very big. For Europe has an area of about 3,800,000, and England and Wales together an area of about 58,000 square miles; and *one* province of Argentina, Santa Fé, a mere patch on the plains, has as much as 51,000 square miles area.

If we take 500,000 square miles as suitable for crops or alfalfa, and accept the official results which give less than 15 per cent. of this as under cultivation in 1909, we see that there is indeed room for a long time to come for the overflow of Europe. Indeed, this is sufficiently indicated by the fact that the estimated population for 1910 of this fertile land, one-third the size of Europe, is only about 6,000,000, or at any rate less than 7,000,000.

II. **History.** *Colonisation.*—The history of the colonisation of the region now called "the Argentine" is very different from those which are given us by Prescott in his Conquests of Peru and of Mexico. There was no "Argentine Empire" to stir a soldier's ambition, no wealth of gold or silver to excite the adventurer's cupidity. To the north-west and west there was territory that came under the rule of the Peruvian Incas, to whose power even the Andes formed no bar; but the vast grassy plains of modern Argentina were probably nearly empty of inhabitants—scattered tribes of Indians wandered over them. Indeed, such plains, to a people who had as yet no horses, were perhaps not suitable as a permanent abode or as the seat of organised communities.

And so, whereas the Spaniards found in Mexico and Peru ready-made empires to be conquered, and therefore could grasp these countries at once when the central powers had been conquered, the greater part of Argentina on the contrary was acquired and colonised slowly as were the prairies of North America.

Coming from Chile and Peru, the Spaniards founded Santiago de Estero in 1553, Mendoza in 1561, San Juan in 1562, Tucuman in 1565, and Cordoba in 1573. And by the end of the sixteenth century there were settlements attached to the Spanish government of Peru where now lie the more northern Argentine provinces of Jujuy, Salta, Tucuman, Catamarca, Santiago de Estero, and Rioja, as well as Cordoba further south; while parts to the west, now the Argentine provinces of Mendoza, San Luis, and San Juan, were attached to the Spanish government of Chile under the title of the province of Cuyo. It is remarkable that so much of Argentina was originally settled without any use of the natural entrance to the country, viz., the River Plate.

To go back a little, the River Plate was discovered in 1516. But the country was not very attractive to Spanish adventurers who sought "Eldorado"; no glowing reports of treasure were brought back.

In 1535 Buenos Aires was founded by Mendoza, but soon abandoned again. And the first town permanently established by Spaniards entering by the River Plate was Asuncion, in Paraguay, this event taking place in 1536.

From Asuncion, in 1573, was founded the first town lying actually in the Argentine plains of the River Plate, and that was Santa Fé. It was not until 1580 that Buenos Aires was perma-

nently founded by Garay. He brought horses, cattle, and sheep, so that ranches might be started; and the settlers found innumerable horses, descended from those left behind by Mendoza after his attempt to found the city earlier. Those who had been born in the country (*criollos*) had not the "gold-fever" of the original adventurers from Spain, and they soon took to stock-farming and the free "camp-life." [See pp. 61 and 309 for "criollo," and p. 309 for "camp."] So, by 1617, there was a considerable area covered with ranches, both on the right bank of the river Paraná and also in what is now the province of Corrientes.

And in this year (or was it in 1620?) the Spanish Crown threw the provinces of Buenos Aires, Santa Fé, Corrientes, Entre Rios, and Uruguay together, separating them from Paraguay, and made one province out of them. Although Uruguay is now a separate Republic, this province of 1617 (or 1620) may be considered to have been the nucleus of the future Argentine Republic.

Spanish Way of treating the Colonies.—The Spanish way of treating the colonies was unbelievably oppressive and annoying for the colonists. All was arranged for the convenience and profit of Spain and of her merchants, and the interest of the settlers was entirely disregarded. Spanish officials filled all the posts; priests played into the hands of the home authorities; trade-routes were fixed to suit Spain; and the colonists might produce nothing that Spain could supply.

Thus, to suit merchants at home, Buenos Aires actually had to get goods by the route over the Isthmus of Panamá, down the Pacific coast to Callao in Peru, and then overland through Bolivia! Nothing might reach Buenos Aires, nor leave it, by the natural gateway of the River Plate. Of course, however, there was smuggling.

Spaniards and Criollos.—Hence it was that in each colony there were, so to speak, two races between which there was an irreconcilable difference of interests. There was the race of criollos, colonists born in the country, and the race of Spaniards who came from Spain to fill all the offices and to suck the blood of the criollos. Indeed, the immediate cause of the separation from Spain, when it came, was not so much direct discontent with subjection to the Crown; there is little doubt

but that the fundamental cause was the irksomeness of the virtual subjection to the Crown's representatives; it was primarily a rebellion of criollos against the Spanish office-holders. So I gather.

A Second Stage towards the Formation of Argentina.—In 1776 there was a re-casting that threw together in one viceroyalty what is now Bolivia, Paraguay, Uruguay, and Argentina; the Spanish governments of Peru and Chile losing provinces that hitherto had been theirs. The River Plate was now virtually recognised as the natural entrance to the country, and Buenos Aires was made the capital, and became the port, of this new viceroyalty. After this, the development of the country went on apace.

Declaration of Independence.—Napoleon's interference with Spain early in the nineteenth century left the colonies without any authority at home to whom loyalty was undoubtedly due; and so criollos and Spanish office-holders were left face to face. In Buenos Aires the criollos were determined to submit no longer to the Spanish caste, and virtually independence of Spain itself was declared in a meeting of May 25, 1810; a day that has given its name to streets in Argentina, and that is regarded as the date when freedom began.

Spread of Freedom in South America.—Buenos Aires and Argentina played a great part, directly by force of arms and indirectly by example, in the movement which made all South America free. Many Argentines, such as Belgrano and San Martin, were conspicuous in the struggle, and statues are now to be seen erected to their memory. Especially, perhaps, does San Martin, who carried Argentine arms from Buenos Aires into Chile and Peru, there to bring deliverance from the Spanish oppressors, deserve to be remembered by the citizens of Argentina.

Constitutional Troubles in Argentina.—From the year 1810 onward there was no real danger of Argentina falling back under the rule of Spanish officials; independence was secured, though Spain did not officially recognise it until 1842.

But there were terrible struggles for about half a century—not to speak of one last settling movement that took place twenty years after that—before internal equilibrium was attained.

The main cause of the disturbance appears to have been the fact that Buenos Aires, city and province together, was, through its large population and its geographical position, much more important than any other province, and naturally wished to represent Argentina. It was not at all inclined to become one of a number of federated States, and so to be obliged to recognise as its equals communities of far less importance. These, on the other hand, were by no means content to become mere appendages to Buenos Aires, nor yet to see an independent and possibly hostile Buenos Aires in possession of the gateway to Argentina.

To cut a long story short, the other provinces federated in 1853 and made out a constitution on the plan of that of the United States, while Buenos Aires held aloof. But in 1860 this latter had to yield to superior force; and in 1862 the constitution was settled, it being practically that of 1853. Buenos Aires became capital of the Federation, and remained capital of its own province as well.

Equilibrium finally attained.—Even by 1862 the constitutional struggles were not quite over. The province of Buenos Aires with its relatively huge capital, which was also the capital of the Federation, was too powerful; and Argentina felt the want of equilibrium. So troubles came again in 1880; and in about 1882 the city of Buenos Aires was retained as the capital of the Republic, while, for the province of Buenos Aires, the far smaller city of La Plata was chosen as capital. This adjustment of weights appears to have been satisfactory; there have been no more constitutional troubles since.

Troubles there have been, and possibly may be again, for, as far as I can understand, there is a tendency among these Latin races of South America for a discontented "Opposition" to have recourse to arms or threat of arms. I imagine that they distrust the results of elections, fearing—and having reason to fear?—that the ballot-boxes may be "managed" by officials who belong to the party in power.

About 1890, there was great trouble and discontent; I gather that the finances and currency of the country had been juggled with. And so there were barricades and street-fighting in Buenos Aires, and the fleet began to bombard the city.

But since 1899, at any rate, the currency and finance have been

on a firm and settled basis; all seems prosperous and stable. And the longer this state of things continues, the weightier will be the interests opposed to any outbreaks or to any proceedings likely to excite outbreaks. The more prosperous Argentina becomes, the more averse she will be from anything that might frighten capital away from the country.

General Roca's Indian Campaign—Fortunes made in Land-Speculation.—In 1878 General Roca made a great campaign against the Indians, and drove them back. To pay expenses, the Government sold the land thus gained at about eighty pounds per square league (ten square miles). For some time people were rather shy of speculating in this, fearing Indian raids, I suppose. I believe that this land had only doubled its value in 1887, and only (!) quadrupled it a few years later. I gather from the *Censo Nacional* that this land sold comparatively recently for from £2,000 to £4,000 per square league, and still more recently for from £5,000 to £50,000 for the same area! Clearly there was, in the years following 1878, a wonderful chance of making a big fortune. So thought my brother, who did not believe in the Indians giving trouble. When he visited England in 1881 he put the facts before some very wealthy friends, to whom £5,000 or £10,000 would have meant little, and who could have bought, say, a hundred square leagues without feeling it. What a fortune would have been made! In 1887 the £8,000 spent would have grown to £16,000; a few years later to £32,000; comparatively lately to £200,000 or £400,000; and, by now, to from £500,000 to £5,000,000!

But it was not to be; and he returned to work (and most successfully) on the slow and steady lines of stock-raising in a land of singularly rapid progress.

Another fact or two concerning the rise in value of land may be of interest.

In 1882 the land at Santa Isabel (the estancia where I stayed) was worth £870 per square league, and in 1890 it was worth eight times as much. What it is worth now, I don't know; I believe vastly more: very likely more than the land next spoken of.

Again, in 1882 a Dutch company bought "cattle land" at £75 per square league, and the same sold at £21,900 per square

league in 1908 or 1909; while a better "wheat land" rose from £82 to £30,700 per league in the same period.

I have reason to believe that a man who knows the country can still buy land that may be worth four or five times as much in (say) ten years' time.

Miscellaneous.—As regards the currency, I remember that in 1888, when I went out, the paper dollar was worth about 2s. 6d., and when I left in 1889, 2s. 3½d. In 1891, but two years later, it was worth only 10⅔d.! In 1895 the value was 1s. 1$\frac{3}{10}$d.; while in 1899 it was fixed at about 1s. 9d., or a trifle less; and at that value—neglecting trifling variations such as occur in all exchange-rates—it remains, and, it is devoutly to be hoped, will remain.

Of revolutions we heard something through my brother's letters. But the bloody struggles in the centres of disturbance hardly stirred the distant "camp." Bands of soldiers would come round for recruits; and all that my brother, and other estancieros, experienced in the way of inconvenience from these revolutions was, as a rule, the running away of their peons, or the sudden appearance of strange peons who wished to be hidden. *They* had no yearning for military glory.

III. Statistics, &c.

(1) *Population and Area, Foreigners and Immigrants.*—Here I shall give mainly the figures of the *Statesman's Year-Book for 1910*; any given as from "*C.N.*" are taken from the *Censo Naconial for 1908*. No doubt the latter is the more reliable source; but I was unable to find in it estimates of foreigners and immigrants for to-day. In the *S.Y.B.*, then, I find:—

Total population in 1895...	**3,956,000**
Estimate for December 31, 1909 ...	**6,805,684**
[The *C.N.* estimate for 1910 is, however,	**6,060,684**]
Estimate of foreigners, not including their children if born in the country, for 1910	**1,744,784**

Estimate of composition of these foreigners :—

Italians	843,540
Spaniards	424,085
French	104,990
English	26,324
Swiss	16,694
Germans	23,450
Austrians	24,785
Various nationalities, mainly from the Latin Republics of South America, especially from Uruguay	280,916

Estimate of the (wild) Indian population for 1910...	**30,000**

It will thus be seen that Argentina appears likely to remain not only Latin, but also Spanish in race, in the main; for, as noted, the last large item is composed mainly of Spanish-Americans (see *C.N.*).

For the three largest cities we have as the estimate for 1908 :—

Buenos Aires	1,189,252
Rosario	150,000
La Plata	80,000

The excess of immigrants into, over emigrants from, Argentina, or the net gain, was :—

In 1903	34,574
In 1906	165,520

And here again there was an enormous predominance of the Latin races, Spanish and Italian in origin.

In the *C.N.* the total area of the Republic is given as about 2,952,551 square kilometres; or about 1,140,000 square miles, or 730,000,000 acres.

(2) *Stock.*—Returns for 1908, taken from the *C.N.* :—

	In 1908.	Gain or Loss since 1895.
Cattle	29,116,625	7,415,099 *more* than in 1895
Horses	7,531,376	3,084,517 „ „
Mules	465,037	179,540 „ „
Asses	285,088	87,216 „ „
Goats	3,945,086	1,196,226 „ „
Pigs	1,403,591	750,825 „ „
Sheep	67,211,754	7,167,808 *less* than in 1895

Concerning these tables I would make two remarks :—

(i.) That the improvement in breed is even more important than the increase in numbers of stock. This was well seen in the comparison given earlier between the stock on Santa Isabel in 1888 and 1908 respectively (see Chapter III.). The following little table further illustrates the matter. It relates to cattle in the province of Buenos Aires, and is taken from the *C.N.* :—

	In 1895.	In 1908.
Coarse native cattle (*criollo*)...	50·2 per cent.	8·7 per cent.
Half-breed (*mestizo*)... ...	49·2 „	85·1 „
Pure breed	0·6 „	6·2 „

Of course, the "pure-bred" percentage must be very small; since the races are being improved mainly through bulls, stallions, rams, &c., and not by wholesale importation of males and females also.

(ii.) The falling off in the number of sheep is interesting. Formerly, the natural grasses of the camp were in general too coarse for sheep; only the province of Buenos Aires, which was "refined" earlier than the more remote regions, could carry many. Now, however, this province has passed on to a further stage, and agriculture has made such strides there that there are about 18,000,000 fewer sheep. But vast stretches of camp further out now carry alfalfa instead of native grasses, and there the sheep have increased in numbers. So, on the whole, the decrease is about 7,000,000 only.

(3) *Agriculture.*—The following numbers are taken from the *C.N.* :—

Nature of Crop.	Area Sown in 1895.	Area Sown in 1908.	
	Hectares.	Hectares.	Acres (Approximate).
Wheat ...	1,600,000	4,854,086	12,000,000
Maize [1] ...	800,000	1,940,884	4,800,000
Linseed ...	300,000	1,266,825	3,130,000
Oats	—	386,261	955,000
Barley ...	—	93,689	231,500
Vines [1] ...	—	122,457	303,000
Fruit trees ...	—	59,190	146,000
Alfalfa ...	712,006	4,656,707	11,500,000
Rye-grass, &c.	—	2,072,169	5,110,000

The above gives a total of about 38,000,000 acres as under cultivation; while, taking a sort of average of the various statements made, it seems probable that about 300,000,000 acres are capable of cultivation. The errors can hardly be so great as to invalidate the conclusion that Argentina is yet in its infancy as regards agricultural development.

(4) *Wine-making.*—From the *C.N.* I get the following results for 1907 :—

Country.	Production in Hectolitres.	Production in Gallons (Approximate).
Argentina	3,171,000	69,800,000
Chile	2,700,000	59,500,000
United States ...	1,600,000	35,200,000
Brazil...	320,000	7,040,000

[1] To illustrate the difficulty of feeling confidence in the numbers quoted, I may mention that the *S.Y.B.* gives 7,345,500 (not 4,800,000) acres as under maize; while the *A.Y.B.* gives 39,000 hectares, and not 122,457, as under vine-culture, and for about the same date, 1908.

(5) *Exports from Argentina in 1908.*

£5,000,000 worth of frozen meat (Whitaker).
3,636,294 tons of wheat (*S. Y.B.*).

1,711,804	„	maize	„
1,055,650	„	linseed	„
113,000	„	flour	„
3,550	„	butter	„
43,977	„	tallow	„
175,538	„	wool	„

The ton here referred to is the metric ton of about 2,200 English lbs., being, in fact, 1,000 kilos. Mineral and other exports may be neglected.

(5) *Railways and British Capital.*—Whitaker (1910) gives 1,300 miles of railways, £150,000,000 of British money invested in them, and £500,000,000 of British money invested in Argentina altogether.

(6) *Weights and Measures and Coinage.*

(i.) The gold dollar is worth about 4s. The paper dollar has been, since 1899, fixed at about 1s. $9\frac{5}{25}$d.

(ii.) In the provinces of Buenos Aires, Santa Fé, and Entre Rios, the old league (still lingering on) is such that—

1 square league = 1,600 "square squares."
= 2,699·8 hectares.
= 10·425 square miles.
= 6,671·66 acres.
So 1 square square = 4·17 acres (about).

In the sale of Government land the "metric league" is used; and it is such that—

1 metric square league = 2,500 hectares.
= 9·653 square miles.
= 6,177·85 acres.
So 1 hectare = 2·47 acres (about).

[I may mention also that "8 kilometres = 5 miles" is accurate to about 1 in 200.]

(iii.) As regards *weight*, there would appear to be some ambiguity about the *quintal*. In the *S. Y.B.* it is given as 101·40 English lbs., or 50 kilos exactly (I imagine).

But the book-keeper on a large estancia, who deals with *quintals* continually, tells me that the quintal of which I heard in 1908–9 was such that—

1 (modern) quintal = 100 kilos = 220 English lbs.

He referred to the quintal of 100 kilos when he supplied me with the prices of grain which I have given in Chapter IV.

(iv.) I take further, for volume, the relation—

1 hectolitre = 22 gallons

as accurate enough.

APPENDIX II

GLOSSARY OF SOME WORDS USED IN ARGENTINA

Adobe.—Sun-dried bricks; made, in the Argentine, of mud and straw.

Alfalfa (often shortened to alfa).—Lucerne.

Alfalfar.—A piece of land planted with alfalfa.

Armadillo.—A burrowing mammal protected by horny armour.

Arriero.—Used in the text of a mule-man, himself mounted, who drove mules and loaded and unloaded them.

Asado.—Meat roasted in a particular way at an open fire.

Avenida.—Avenue or boulevard.

Azotea.—A flat roof accessible to the dwellers in a house; a characteristic of estancias built in "Indian" times.

Bastos.—Long stuffed bolsters, lying one on each side of the spine of the horse under the upper rugs and skins, which give the characteristic flatness and breadth to the Argentine saddle.

Bayos.—A word used to designate the bricks that turned out soft in the baking.

Bebideros.—Drinking-troughs.

Bicho.—Used of insects, caterpillars, &c., or of any "vermin," such as foxes, viscachas, rats, snakes, frogs, lizards, &c.

Bicho de canasta.—A caterpillar that lives in a house of leaves and twigs; as it grows larger, it enlarges its house.

Bien-te-veo ("I see you well.").—Name of a bird resembling a kingfisher in form; derived from its cry.

Bocado.—A thong put round a horse's lower jaw, behind the teeth, used as a bit in breaking-in a horse.

Boleadoras.—A primitive hunting weapon consisting of three balls connected by thongs, one being smaller and held in the hand. It is whirled and thrown, and entangles the quarry's legs.

Bombachas.—A kind of loose wide trousers, buttoned in at the ankle, much worn by camp natives.

Bombilla.—The tube, with a sort of perforated filter at the end, through which yerba is drunk from the maté gourd.

Bordos.—Ridges, wind-drifted originally, in sandy camps.

Bozal.—Head-stall, or head-collar, of a horse.

Brasa de fuego.—A small bird, mostly of a vivid crimson.

Cabresto.—Hide or leather thong attached to the headstall of a horse, to lead or tie him up by. Much needed, since the bridle has no throat-lash.

Camp (English form of the Spanish *campo*=plain).—Used in three senses. (i.) The plains or open country as opposed to the towns. Thus a "camp-man" means usually a man whose business is with the breeding of cattle and the like. So also one speaks of camp life, a camp town, a camp auction. (ii.) A block of land; one can say, "I bought three leagues of camp," "Mr. Smith's camp," and the like. (iii.) Land or soil, as in "The camp is very sandy there," or "What sort of camp is it?"

Cañon.—Narrow gorge or gulley with steep-cut sides.

Capataz.—Foreman or headman.

Carcarañá.—A long metal scoop used for scooping up hopper-locusts; named from a certain town.

Cerro.—Hill. But used in the maps of high mountains, such as Aconcagua.

Chacarero (or *chacrero*, or *chaquerero?*).— The holder of a *chacra*.

Chacra.—A holding of land of such relative smallness that the owner or lessee is rather a small farmer than an estanciero.

Chañar.—A tree very common in the sandy camp that I visited in April, 1909.

Chemango.—A very common carrion-hawk.

Chiripá.—A sort of shawl or poncho, tucked in at the belt and covering the hips and thighs, worn over drawers. It is part of the loose "gaucho" dress that is passing out of use now.

Cigüeña.—(i.) A stork or crane; (ii.) the machine called a crane.

Colonist.—One who rents land for agricultural purposes.

Corancho.—A large kind of hawk.

Corral.—Enclosure for horses, cattle, &c.

Criollo (Anglo-Argentine "native").—Keeping to the purely Argentine use of the word—[see p. 61 for the more general sense]—we have for its meanings—

(i.) When used as a noun, a person of Spanish origin born in Argentina. The word is never used of the aboriginal Indians.

(ii.) When used adjectivally, all that is characteristically Argentine or is racy of the soil.

Cuis, Cuiz, or **Cuizo** (I am not sure of the spelling).—A sort of guinea-pig native to Argentina.

Dollar.—The English word for *peso*. Usually means the paper dollar, of which, ever since 1899, about 11½ go to £1. The symbol is $; but in business one adds m/n (*moneda legal*), or m/n (*moneda nacional*), or m/c (*moneda corriente*.) The Argentine gold dollar, worth about 4s., is a standard and not a coin in circulation. When this is referred to, one adds *oro*, or o/s (*oro sellado*).

Domador.—A horse-tamer who breaks in riding-horses.

Estancia.—Used in Argentina of (i.) the house on an estate; (ii.) the house and property regarded as a farm. Regarded merely as a piece of land, the estate would be called "Mr. A.'s camp."

Estanciero.—The owner of an estancia (house and estate).

Fonda.—The smaller sort of inn, inferior to an hotel.

Galpon.—Large permanent barn in which are stored implements and produce (such as hides, wool, grain).

Gaucho (see p. 62).—Camp native of the old type and way of life; a horseman and handler of cattle and horses, not an agriculturalist.

Guanaco.—A sort of llama which has rather coarse wool, larger than the *vicuña*.

Guia.—(i.) Leader or tendril of a plant (such as the pumpkin); (ii.) ticket for baggage; (iii.) recently used of mountain guides, though (I believe) *vaqueano* is better in this sense.

Hopper.—The locust before it changes into the mature winged insect. English for *saltona*.

Hornero.—Oven-bird; this makes a nest like a mud oven.

Iguana.—A sort of lizard whose length runs up to 4 feet or so.

Jagüel.—Well with bucket (emptying itself automatically), worked by a horse ridden to and fro.

Junco.—Rush or reed.

Ladero.—A horse with rider helping to pull a cart by a trace attached to the saddle-ring; it goes at the *side* (*lado*) of the shaft-horse.

Lata.—A metal disc used in paying shearers, exchangeable for money at the end.

Lazo.—A long rope of plaited or twisted hide, or nowadays, even of hemp, with a slip-knot at the end; used for noosing animals.

Laguna.—Pool, mere, pond, lake, tarn.

Lechera.—Milking cow.

Lechuza.—The small burrowing owl.

Lino.—Flax; grown in Argentina for the seed (linseed) only. A very important Argentine crop.

Maizal.—A plantation of maize.

Manga.—(i.) A flight or swarm of locusts whether winged or as yet wingless; (ii.) a narrow wooden "run," with sliding doors, used in handling cattle and horses.

Mataco.—A rarer kind of armadillo that can roll itself up into a ball.

Maté.—(i.) Properly a sort of small gourd or calabash, but always used of the Paraguay tea (*yerba*) when drunk out of this; (ii.) hence, somewhat improperly, used of this tea when made in and drunk out of other vessels.

Mayor-domo.—The understudy of the estanciero or manager, working under him, second in authority. Usually he aims at getting a managership himself some day.

Médanos.—Sand-dunes.

Mojon.—Boundary mark of any kind; of wood, earth, stone, iron, &c.

Monte.—(i.) In Argentina appears to be used always of a grove of trees, and never of a hill. (ii.) Our Chilian arrieros used it also of weed in a pool. Probably to them it meant any kind of vegetable growth that was not pasture.

Mosquitos.—(i.) Gnats, as with us; (ii.) used also of hopper locusts in the earlier and smaller stages.

Mulita.—A kind of armadillo, mule-eared.

Muy.—The Spanish for "very."

Native.—Anglo-Argentine word for *criollo* (q.v.). Never used by Englishmen of aboriginal Indians.

Noria.—A well with endless chain of buckets worked by horse or mule that goes round and round.

Novillo.—The usual word for ox or bullock. Anglo-Argentines always use this Spanish word.

Oficial.—Artizan, as carpenter, *e.g.*; has a trade. Ranks above a labourer. A bricklayer is an *oficial;* a *peon* keeps him supplied with bricks.

Padrino.—Sponsor. The word was also used when referring to the tame horse which, with a rider, accompanied the domador when he was breaking in an untamed animal.

Paja.—(i.) Coarse grass; (ii.) straw.

Palenque.—A post, or two posts with a cross piece, to which horses are tied up.

Palenquear, to.—To accustom an untouched colt to be tied up to a palenque and to be otherwise handled. This does not include breaking in to saddle or carriage.

Pampa.—Grassy plain or prairie. "The Pampas" (plural) is used of the vast plains of Argentina. Also the name of a territory of this Republic.

Paraiso (or Paradise-tree).—A very handsome tree, remarkable for not being attacked by locusts.

Patio.—Courtyard of a house, more or less surrounded by the buildings.

Pechicolorado.—A bird; the male has a splendid crimson breast and is otherwise nearly entirely black.

Peludo.—The largest kind of armadillo found in Argentina, more *hairy* than the other sorts.

Penitentes.—(i.) The columns, cones, or blades into which ice and snow in the Andes appear always to be broken up—probably by the sun's action. Supposed to resemble persons in white penitents' garb. (ii.) Used also of rock pinnacles of something the same form.

Peons (Spanish plural is *peones*).—Usually means the "hands" on an estancia, workers with stock. But used more generally of any

unskilled labourers in camp or town. A man hires himself out as a peon and ceases to be one when the contract is at an end.

Piche.—A small kind of armadillo.

Pisadero.—Enclosure in which mares trample (*pisar*) earth, straw, and water into a tough mud for adobe or bricks.

Poso.—Well, with bucket raised by hand.

Potrillo.—A young colt.

Potro.—A colt.

Puestero.—Peon occupying a *puesto*.

Puesto.—A small hut or house for a peon, usually carrying with it special duties. Sought after by married peons.

"Querenched" to a place means reconciled to it, settled down contentedly in it (Sp. *aquerenciado*).

Rebenque.—A sort of whip, used by horsemen, composed of a short thick handle and short broad thong. It bangs a horse rather than cuts it.

Recado.—The Argentine saddle, built up of many parts. See p. 101.

Rodeo.—A body of cattle rounded up in the open.

Romerilla.—A weed poisonous to stock of all sorts.

Roseta.—A plant having very spiny and hard seeds; a great trouble to dogs in camps where it abounds.

Saltona.—The locust before it changes into the mature winged insect. Used generally of the later and larger stages only, the word *mosquito* being used of the earlier stages.

Sandías.—Water-melons.

Sauce.—Weeping willow; grows freely when planted in the Argentine plains.

Screes.—In the part relating to the Andes I use this word, known to mountaineers, for slopes of loose stones.

Sortija.—The ring used in a sort of tilting game that tests a horseman's skill; or the game itself.

Teru-tero.—The Argentine peewit, a spur-winged plover.

Tirador.—The broad Argentine belt, usually ornamented with silver coins.

Toldo.—(i.) Indian tent; (ii.) awning to a wagon.

Tropilla.—Little troop. A troop of, perhaps, some ten or twelve horses trained to keep with a bell-mare.

Vale.—Lit' "it is worth." An order for money, like a cheque.

Vaqueano.—(i.) *Sub.* a guide; (ii.) *adj.* skilled in anything.

Vaquillona.—Diminutive from *vaca*, a cow, and meaning "heifer."

Varillas.—The rods of wood, iron, or twisted wire that keep the wires of a fence at the right distance apart. There will be some five of them between the posts, and they are not fixed in the ground as the posts are.

Vicuña.—A small kind of llama with very fine wool ; smaller than the *guanaco.*

Voladora.—The mature winged locusts.

Yerba = "herb."—Used to denote Paraguay tea. But this latter, when spoken of as a drink, is usually called *maté,* from the gourd out of which it is nearly always drunk.

Yuyo.—This is a camp word, and the *y* in Argentina is sounded like the *j* in jujube. Weed.

Yuyo blanco.—A weed very common in the sandy camp that I visited.

Zapallo.—A sort of pumpkin ; much superior to our vegetable marrow. It grows to an enormous size.

PECULIARITIES OF ARGENTINE PRONUNCIATION

(i.) *ll* and *y* are pronounced like *j* in the word *jujube.*
(ii.) *ado* is pronounced like *ow* in the English *cow.*
(iii.) *z* is pronounced like *s* [cazar like casar] ; not like *th.*
(iv.) *c* before *i* and *e* is pronounced like *s,* not like *th.*

A combination of the above peculiarities may make a word difficult to recognise. Thus *callado* is pronounced *cajow* (see above for *j* and *ow*).

Terminal *s*'s were often dropped ; *dos* and *màs* sounded much like *dō* and *mă.*

Other *s*'s may be dropped ; I have heard *este* sound very like *ĕtĕ.*

The peons and others of the gaucho class had a very peculiar way of dealing with certain combinations of words, mainly prepositions and adverbs, I think. The only instance that I remember was the transformation of *de donde* into something like *de ande.*

There are further peculiarities consisting in the sense in which words are used. Thus the word *recado* means the Argentine saddle ; but the dictionary does not give this meaning at all.

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