

## NOTES ON THE ANTHROPOGEOGRAPHY OF ARGENTINA.\*

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OUR geographical knowledge of Argentina has been considerably increased during the last few years. The Andes have been explored, as well as the Patagonian tablelands and the Fuegian islands. Important discoveries have also been made in the geology, palæontology, and anthropology of these regions. The ancient relations of South America, not only with the antarctic lands, but with Africa, India, and Australia, have been shown, as well as the existence during supra-jurassic times, before the upheaval of the Andes, of a great range of mountains to the west of Chile where the Pacific extends to-day. Palæontology has confirmed these geological relations. The extension of the Gondwana flora to Argentina, and the identity of some South American vertebrates with those of Australia, are no longer matters for conjecture. Changes, also, in the relief of the southern part of the American continent, in the contour of the coast, and in climatic conditions, have been noted in recent times, and some of these results are of remarkable importance when viewed in connection with the distribution of mankind. Without doubt, geographical conditions in pre-historic Argentina afforded unlimited hunting-grounds, arable lands, and homes to vanished races of men. I think, then, that it is not beyond the programme of this section to attempt a general enumeration of the people who once inhabited it.

### I.

When, in 1873, I visited for the first time Patagonian lands, I was struck by the number of human types in the graves of the old Indian encampments in the valley of the Rio Negro. It seemed to me that here was a general burial-place of all the American races during their forced migrations to the extreme south of the American continent. Afterwards, when I crossed the Argentine territory, I looked for the races represented in these graves, and little by little I penetrated the great mystery; and comparing the lost races with those existing to-day, by the remains of their industry left to us, and by a knowledge of the geographical environment in which they wandered, it is possible for me to-day to say something which may induce others to take a greater interest in the anthropogeography of South America before the times of Columbus.

I will not discuss the origin of the primitive South American whose remains have been discovered in the Brazilian caves and in the Pampean

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loess in close association with the bones of extinct animals. The confusion produced as to the epoch of extinction of these mammals by the exploration of the Mylodon cave in South Patagonia would require a long explanation, which time does not permit of to-day; neither will the question be discussed whether this primitive man is of the same type as the Eskimo, or whether he is only a descendant, or whether they are both representatives of entirely different peoples separately developed. But as introduction to this short account, I will only say that the Pampean sea, the Moxos lake of Bolivia, and the Amazonian lacustrine area, so well described at the Bristol meeting, and at the Royal Geographical Society, by Colonel George Earl Church, have had great influence on the geographical distribution of man in the early history in South America. By these broad waters the Brazilian land-mass was separated from the Andean land-mass. There is no doubt that man lived in South America in early pleistocene times, and it is also undoubtedly a fact that during the pleistocene period a great part of that continent had not the same physical features which it bears to-day. Very probably the Caribbean sea had not its present extension. The Andes had not reached their present elevation, and lands existed to the west and to the south-east; these are all geographical features necessary to explain many facts observed in the distribution of man in America.

In the southern part of the Brazilian or eastern region, which very probably was more extensive than at present, the dolichocephalic or long-headed type developed; in the Andean region, the brachycephalic or round-headed type; and a third intermediary type came later on from the Columbia-Venezuela region in the north. The first two types developed separately, till, with the slow decrease of the Pampean sea and of the big lakes, inter-communication was possible. In those times, with the appearance of the pampean loess above the sea, other lands in the neighbourhood sank, the great mammalian fauna commenced to decay, and the Atlantic coast took its present contour (leaving only as proofs of the past existence of the lost lands, the polishing of rocks by wind-blown sands from these lands); sea arms advanced 300 miles to the north of its present boundary, sufficiently deep to allow the passage of whales, and great rivers flowed into the large bays of San Borombon or Bahia Blanca; hundreds of lakes extended on the now low lands, and then men of the east and of the west met, and the mixture of the types commenced.

In that age the climate was different from that of the present. The Andes had not formed their present continuous barrier between the Atlantic region and the Pacific region; vast glaciers still existed in the northern lands, descending to the valleys of the western highlands and giving a damp climate to the arid regions of to-day. In Patagonia the glaciers advanced eastwardly. While the geographical conditions were

favourable to human life in the north, not only men but huge animals could pass easily across the Andes; in the south the ice-sheet closed the field for the development of man, and he only reached the low depressions by the east.

In the Brazilian region dolichocephalic men advanced slowly in culture, tribes were formed, dissensions arose between them, and forced migrations commenced. Some of the tribes acquired more industries than others, which spread over the hydrographic net and along the Atlantic; the remains of this industry, from the Paraguay river to the Amazon and the Atlantic, show the intimate relations between the tribes in early times.

While nomadic conditions governed these eastern men, in the Andean regions brachycephalic men initiated a different culture, adapted to the different geographical features, and created the first settlements. Meanwhile a third type, mesocephalic, advanced from the north, sending its representatives to the east and to the west, during its march into the regions occupied by the two others, and thus new mixtures appeared in race and in culture.

To this third type pertain, I think, the petrographs which have been observed in all South America. I will call the first type the south Brazilian type, the second the Andean type, and the third the Tupi-caribbean type; from these three descend all the old South American tribes. Beside these types other people came to that continent after. Undoubtedly there is a connection between South Americans and North Americans, and also with the peoples of Polynesian origin, but the basis of the entire population was the union of the three types mentioned. I shall not inquire here into the common origin of some of the Pacific Oceanic races with those of South America, or into the similarities which they offer, explainable only by old land connections; but I will merely mention that in the graves of Rio Negro there are human remains that cannot be referred to any living race of South America, but only to those of Polynesia. Some of the skulls from Rio Negro and the Calchaqui region are of Papuan type. Maori stone implements have been discovered at Cuzco in Peru, and at Santiago del Estero in Argentina; carved wood clubs, entirely similar to those of the Marquesas islands, have also been brought from the ruins of Truxillo in Peru, and from Quillota in Chile, these being preserved in the La Plata Museum, while others have been discovered in Colombia, Ecuador, and other places in Peru. The similarity of some Polynesian monuments with those of Peru is well known, but it is unnecessary to go outside America.

Several of the human types of the Rio Negro pertain to races totally extinct. Amongst these are the Neanderthal and Tasmanian type, others dolichocephalic which is connected with the Botocudo type of south Brazil and to the men of the mounds of Rio Grande and Uruguay. A

third type, mesocephalic, represents the Fuegian type of the Yagan and the Alakalufs which, while speaking two different languages, seem to be of the same race. A fourth type is that of the Onas of Tierra del Fuego. A fifth represents the Tehuelches of the old race; a sixth the great Patagonians or the Ahóneckenes; the seventh the Gennakens (or the true Pampas); and eighth a type very much resembling the Calchaquis and Huarpes of the north-west part of Argentina. These are normal types, but there are others showing artificial deformations not less interesting. Every kind of skull deformation is represented in these graves—those of the Aimaráes, the Pampean races, the Calchaquis, the old Peruvians, those of the North American Indians, and some also of Central Asia and Europe.

Some of these types represent races that have arrived in Patagonia from the north, following the Atlantic coast. In the burial-grounds which I have explored in the western regions I discovered only the Ahoneckenke, the Gennaken, and the Araucanian type, while some in the neighbourhood of Lake Buenos Aires pertained to the Chonos Indians of the Pacific coast. It is also necessary to say that in the old encampments to the south of Chubut, from which the La Plata museum has obtained a good number of human remains, the number of types diminish. There are in the extreme south only those of natives still existing, which seems to show that the other types became extinct before reaching these latitudes.

I will now try to show who are the present representatives of these men, and the places in which they now live. Of the primitive dolichocephalic type there does not now exist any living individual; it belongs to an extinct race. This is not the case with the first mesocephalic type which is represented by the Yagan and the Alakaluf. I have known personally the two individuals who have been photographed, and can state certainly that they do not in any way answer to the popular idea of the inferiority of these races. They both learned to read and write, took an interest in drawing, spoke a little English and sufficient Spanish. The Yagan was amiable, sensible, and kind, while the Alakaluf was somewhat gloomy, inclined to theft, but kind with children; both were interested in all they saw; the second was extremely skilled in the making of stone arrow-heads, while to the first the La Plata museum owes the possession of many very valuable palæontological specimens. This apparent inferiority is due to the land environment in which they obtain their food, principally by fishing in the fjords in their canoes; but a certain number of Yagans now work in the Argentine settlements of Beagle channel, and several have become good sailors. It is impossible to decide to-day whether these two races proceed from the southern Brazilian stock; but several of their usages undoubtedly belong to a former manner of living. Their masked dance, and ornaments, for example, are remembrances of an old sunny fatherland. In their present

cruel surroundings they are losing much of the better culture brought by their ancestors, and are rapidly becoming extinct.

The second mesocephalic type is that of the Onas, a tribe only very recently known to Europeans. When travelling in Patagonia twenty-five years ago I met more than once some men living with the Tehuelches having an ethnical type different to the people with whom they lived. According to the latter, they were descendants of other Indians. These men were identical with the Onas, and were the issue of men left behind during the migration to the south. It is a matter for conjecture how the Onas crossed Magellan strait, as they do not know the use of canoes, but there are two suggestions to offer in explanation: (1) that they arrived there when a broad glacier and its moraines occupied in part the depression of the strait of Magellan, bridging the continent and the island; or else (2) that they crossed before the formation of that depression. With the Onas, as with the Yagans, their reputation for inferiority is not altogether deserved, and when they have come in contact with the colonists their characters modify rapidly. There are among them, men and women, intelligent individuals, though at first meeting with civilized people they appeared stupid with astonishment and suspicion. The Onas are huntsmen, not fishermen, and undoubtedly their original fatherland is situated further north. The vicissitudes through which they have passed in their migrations are unknown, but it is not hazardous to say that their ancestors lived in more fertile lands. Like the Tehuelches and Gennakens, they hunted in the great plains of the midland of Argentina.

It is not generally recognized that under the Araucanian name of Tehuelches there existed two different types. The old Tehuelches (now extinct for twenty years) were greater in height, of darker complexion, with well-developed bodies, and speaking a different language. The other Tehuelches, of which a few representatives exist to-day, though great in height, are slender in general proportions, and of a type which may have resulted from the mixture of the old one with the Onas and Gennakens. To this type belonged the men whom Magellan saw. I do not think that the old Tehuelches were numerous, and in the burial-places of the Rio Negro are very few of their remains, and I have not obtained others from the ancient encampments or graves that I have examined in many other parts of Patagonia; but the common Tehuelche type is spread over all the southern part of the continent, mixed with Gennakens and Araucanians, and there are proofs of the existence of that race in central Argentina as late as the middle of the eighteenth century. Next to the Tehuelches are the Gennakens, which have many analogies with the Tehuelchean type, but they are of smaller stature, and speak another language. This race, now represented by very few individuals, has had the largest influence amongst the nomadic plain tribes in South America. It migrated from the north, and it

is possible to trace it from the northern plains of Argentina southward to the centre of Patagonia, where its last representatives are now found. These were the men who lived in Patagonia and Tierra del Fuego at the time of the voyage of Magellan; the Araucanians were confined to the two slopes of the Andes between  $35^{\circ}$  and  $41^{\circ}$  S. lat., and some few Chonos occasionally passed from the western channels to the eastern valleys by the Andine reaches of the south; the mummified Indian which I discovered in 1877 in the Lake Argentino being the single proof that the enigmatic men bearing the macrocephalic deformation, whose remains I obtained from the Rio Negro burial-grounds, extended as far as  $50^{\circ}$  south.

The anthropological types which I have mentioned as having lived in the southern extremity of America were men of very low culture, but amongst them, however, were representatives of higher types. There have been discovered in the ancient encampments a few fragments of somewhat elaborate pottery, evidently brought with the migrators, for neither the Pampean, the Patagonian, nor the Fuegian tribes were potters. In the La Plata Museum we have some vessels in a good state of preservation from the Chubut valley, analogous to those used in the provinces of the north-west of Argentina, and with the same have been discovered perforated turquoises, which undoubtedly come from the same provinces, as there, in the old times, this stone was extremely appreciated for use as necklaces and mosaics. Were this pottery and these turquoises brought by migrants, or were they the result of commerce? I am inclined to think that they were brought by the nomadic Patagonian and Pampean tribes in their periodical marches to the north and south.

I have said that amongst the remains buried in the ancient encampment of the Rio Negro were skulls showing a great number of types of artificial deformation skull. These remains caused me to look for the northern races of Argentina. The man represented by the fossil remains discovered in the Pampean mud pertains, as it has been said, to the primitive type discovered also in Brazil, but as we advance further north remains of other men appear, and the tupi-guarani type takes the principal place.

Along the littoral of the La Plata estuary it is possible to follow the southerly march of all these prehistoric races by their remains. It is still a mystery who were the ferocious Charruas inhabiting the Atlantic coasts of Uruguay; whether they were of the Guarani stock or the result of a mixture with the primitive type. Some of their stone implements resembled those found in the Rio Negro valley, and their peculiar stone clubs have also been discovered there as well as in the Chubut valley. In the La Plata Museum there are some stone axes and some zoiform stones from Uruguay similar to those discovered in the Calchaqui region, but different to those of

the Brazilian tribes. In the delta of the Paraná have been found burial urns of the same shape as those used by many old Guarani tribes of Brazil, while, advancing to the north, the Minuanes remains of the province of Entre Rios show a race which seems to have come in contact with both the Guarani and Charrua type. Probably the Querandis, who, at the time of the Spanish conquest, were settled where to-day is the town of Buenos Aires, were mixed with Guaranis, as they were huntsmen and fishermen. Further north we meet the Misiones tribes, all of Guarani stock, so tractable that they were easily dominated by the Jesuits with satisfactory results. A few Europeans, not purely Spanish, in a few decades reduced these savages to semi-civilized life. I have seen very good copper etchings made by them, and it is presumable that the numerous carvings in stone and wood in the churches were worked, not by the missionaries, but by native artists. To-day only a few ruins of a past comparative magnificence remain; the Indians have returned to their primitive manner of life, and only quite recently civilized man have reached and again commenced to exploit the country, which possesses richness of soil, magnificent forests, splendid rivers, and prodigious waterfalls. There the poor Indians of Guarani extraction fish and hunt without fear of the Europeans; but the wild Guayaquis, who seem to be the remnants of one of the primitive types, wander in the forest in a low state of culture, identical with some of the migratory peoples which I have mentioned before.

I wish to draw attention to the stone axes of these Guayaquis, made of a stone slightly polished, inserted in a branch of a living tree cut down after the growth has compressed the stone. I know of nothing similar to this among other races.

Going to the west, crossing the Parana river, we met the Chaco tribes, who were very numerous during the sixteenth and seventeenth centuries; speaking different languages and dialects to-day, these tribes are reduced to the Chamacocos, the Matacos, Tobas, Mocovis, and Chirihuanos. Putting aside the Chamacocos, whose culture approaches that of the Tupi-Guaranis, the other tribes seem to me of the same stock as the pampean tribes, differing only in habits due to the lapse of time since their appearance in South America and to the surroundings—the treeless pampa poor in water, or the forest region crossed by many streams. The physical type has, however, so many resemblances that the suggestion of a common origin is not without reason.

## II.

When the Spaniards came overland from Peru to Chile from the river Plate to the country which is now the centre and north-west of Argentina, they met different peoples who were more cultivated than the tribes of the lowlands in the east. In what is to-day the Cordoba region, and in Tucuman, they met some agricultural tribes; and,

penetrating to the mountain region, they were stopped by semi-civilized and warrior peoples, the population being great, and agricultural pursuits and irrigation practised everywhere. In the San Juan and Mendoza region, to the west, they also found large agricultural population. Moreover, the ancient chronicles tell us that in the countries settled by these populations there were ruins and other remains of unknown peoples upon which later discoveries have not thrown much light. In the Argentine region bounded on the east by the Chaco forests, on the north by the salt plains, by the pampas on the south, and on the west by the crest of the Andes, numerous sites are found containing specimens of ancient arts and industries. Argentina thus forms one of the most interesting of fields for anthropological research. Proceeding from the south, we see the ancient settlement of Cordoba and San Juan, where beautiful earthenware, human and animal figures in pottery and stone, stone arrow-heads and axes perfectly polished, are exhumed, and not infrequently human remains—the first sometimes in the same bed and at the same depth as the remains of extinct mammals. In Mendoza I have photographed isolated petroglyphs, remarkably similar to those found in the south-west of the United States, Mexico, Columbia, Guiana, and in Northern Argentina. Further to the north, proceeding along the mountains, the same petroglyph becomes more numerous, and in many points rocky walls are covered with these probably mythico-religious figures. In the neighbourhood of the town of San Juan, I have explored some ancient encampments. In the plain were human remains of the type of the common Tehuelches and Gennakens, while in the mountain valleys the remains were of a more advanced agricultural people, and the anthropological type was also different, approaching the Calchaqui of the north. In the lower valleys, close to the eastern foot of the Andes, I explored some very old places in which several bodies were adorned with Pacific marine shells and with wooden ornaments, containing mosaics of turquoises, evidently extracted from a neighbouring hill. The great South American road called “the Incas road” passes along this valley at the foot of the mountains, to the Uspallata gorge, through which it turns westward to the summit of the Cordillera and crosses to Chile. Stone walls are in every part by the side of this road, and numerous petroglyphs show that the road was made by the same race who used to carve the stone.

This so-called “Incas road” was, I believe, built before the Incas settled in Peru. Moreover, in the Andean gorges I have seen extensive ruins where to-day life is extremely difficult or impossible during a great part of the year, and extensive irrigation works are to be seen where to-day one could not possibly find a drop of water, showing that the climatic conditions of these regions have changed, and that the waters must have diminished. It is known that a century ago the small lakes of Guanacache, between San Juan and Mendoza, were much

more extensive, and that the Indians navigated them in the same manner as they navigate Lake Titicaca at the present time. In all these regions I have neither seen nor heard of burial urns. If we ascend from the regions of Cordoba to the Andes northward, we arrive by the east at what is to-day Santiago del Estero and the eastern slope of the Aconcaguan ridge. I have pointed out that in the Paraná highlands to the north there were Indians who were accustomed to bury their dead in urns, and when in 1876 I studied some ancient encampments on the banks of the Rio Dulce, close to the town of Santiago del Estero, I discovered with surprise some urns made of a rude material containing bones. Close to these I found an enormous quantity of broken pottery, of workmanship I have never seen before in Argentina, but similar in colour and drawings to some ancient pottery of the Shiwi of North America. From these urns I obtained a well-preserved skull, and another not so well preserved, the first of the deformed type, resembling somewhat those of the Rio Negro in Patagonia, and those of the Calchaqui, Ancon, and Chinooks of North America, but more exaggerated; the second seemed a normal skull of the mesocephalic type, and inside the urn were some marine shells of the Pacific ocean. One axe in stone of the general Calchaqui type, and some other carved stone, I obtained from a cave in the neighbouring hills, and I was told that these caves were to be found in large numbers, and that all had been inhabited by men. It was near this spot that a Maorian stone club was discovered. Afterwards I discovered that these ancient settlements continued to the north-west, and we have in the La Plata museum very interesting specimens, notably a great burial jar, showing the holes drilled in the bottom, as was the custom amongst the Shiwis of the south-west of the United States. The man buried in it was of a type very different to those of Santiago and Calchaqui, and mixed with the bones I picked up a small piece of lead with an iron handle, the only piece of that kind that I have ever seen. The iron has not been analyzed yet, so I cannot say whether it is of meteoric origin not uncommon in the region. Continuing by the east of the mountains, we arrive at the Salta and Jujuy region. There is the gate from the high plateau of Bolivia and the headquarters of the old Juris, the "taller and darker men" mentioned in the first chronicles. There the remains of ancient inhabitants are more numerous, and their implements and bones show that there was a population composed of Calchaqui, Chirihuanos or Tupi-Guarani, Patagonian, the so-called old Aimara, and Peruvians. West of this region is the valley of Guachipas, by which the Calchaqui easily reached the open country; to the north and north-west is the road of Humahuaca, and the Rinconada whence gold ornaments have been obtained. These were the ordinary routes taken by the Spanish during the earlier years of the conquest. It is impossible to say whether the Juris, as the name seems to indicate,

were one of the Patagonian types,—“the Ostriches,” which the pampean Indians have hunted so much, because the aboriginal settlements of that part of America are so old; but it may be that the populations who met the Spanish in that corner were the result of a mixture of many races. Doubtless they included the same tupi element met with in the eastern side of the Andes from Columbia to the extreme south.

I will now say a few words on the more interesting general type of the Argentine native population, the Calchaqui, who merit more attention than they have hitherto received from geographers and anthropologists.

The eastern side of the southern prolongation of the Bolivian Andes in the north-west is wooded and well irrigated by nature, and slopes gently to the pampean and Chaco plains; but, crossing the high mountains of the Aconquija range, penetrating by the valley of Guachipas, or to the south by the dry salt plains of the Llanos of San Juan, La Rioja, and Catamarca, the traveller will see regions of very different aspect. A series of parallel ridges, very seldom wooded, sharp, and reaching sometimes 18,000 feet altitude, runs north to south as the termination of the central Andes of Bolivia. To the east is the long valley of “Calchaqui,” extending from the Argentine-Bolivian high plateau in 22° S. lat. to the transversal ridge of Capillitas in the centre of the province of Catamarca. To the east of this valley rises the chain of Aconquija, and to the west the snowy border of the Puna of Atacama. The valley is sometimes narrow, sometimes broad, with subsidiary valleys which communicate with the Puna of Atacama on the west, with Salta and Jujuy region on the east, while towards the south it expands into a dry basin in which end other small valleys from the north and west, and to the south-west it narrows into a gorge communicating with the vast ancient lacustrine basin of Catamarca. The Puna plateau highland, the lowest point of which is at an elevation of more than 10,000 feet, is covered to an extent of nearly 60,000 square miles by some low ridges half buried in the ashes and lava of hundreds of volcanoes, several of which reach an altitude of 20,000 feet, and are still active; salt dry lakes, where borax is now being dug, also lie in this region. To the south of the Aconquija knot is the valley of Singuil and Catamarca, which ends in the salt plains of Rioja and Cordoba. To the west the Ambato chain separates from the broad old lacustrine basin called las Salinas of Catamarca, in the north-east corner of which is Andalgalá, and in the north-west corner Belén, at the gate of the gorge before mentioned, and Londres, of Catamarca, a very humble village so named by the Spanish conquerors when Philip II. of Spain was husband to Mary Queen of England.

To the west and south-west stretches a mountain ridge, with a projecting spur to the south; the latter is cut by the river of Tinogasta,

and is known as the Sierra de Velasco. At its eastern foot lies the town of La Rioja, and further east the valleys of Vinchina and Tinogasta. The latter extends south-west into the province of San Luis, which is bounded on the west by the high chain culminating in Mount Famatina, which is 20,000 feet in height. The valley of Tinogasta communicates with the western depressions. The narrow gorge of Watungasta across it was the best route in early times to Copiapo, in Chile, and thus in its entrance was a Calchaqui military post. To the west lofty mountains, generally volcanic, reaching an altitude of 22,000 feet, and deep salt depressions render permanent settlements impossible. To the south and west of Famatina chain open the long valleys of Vinchina and other narrow valleys running west, carrying the waters of the whole region southward to the great basin of the river Colorado, which, however, does not reach the Atlantic.

All these lands are arid and volcanic, in great part broken by old erosive action, having a desert appearance similar to the south-west regions of the United States of North America and the north-west parts of Mexico. The vegetation where irrigation has not reached is poor, and the predominant tree in the lower plains is the algarrobo or carob tree. In the highlands volcanic rocks predominate, and the scenery now seems that of a dead world. With their black and grey lavas, ashes, and sharp broken stones, which running water has never smoothed, and strong winds blowing almost continually, these dreary, broken lands are apparently unfit for permanent human settlement; but that has not always been the case. My duties have taken me several times to many of these plains, valleys, gorges, and summits, and in every part I have seen proofs that it was once settled, the climate being then mild and temperate.

I have said that the Calchaqui valley, properly so called, extends from the Argentine-Bolivian high plateau to the south. Northward, where the land reaches an average elevation of 10,000 feet, there are remains of very large settlements once occupied by mixed races of so-called Calchaqui, Aimara, and Peruvians. Calchaqui civilization commences for my purpose in the region to the south of the gap of Acai, which is an elevation of 15,000 feet. In 1893 I visited that region, penetrating to it by the gorge of Belen; I ascended the high plateau of the Puna to Antofagasta de la Sierra, descended to the east to Calchaqui valley, and, following it to the foot of the above-named gap, I came again to the Puna, reached Mount Zapaleri at  $22^{\circ} 15'$  S. lat.; then, returning straight to the south, again reached Antofagasta de la Sierra, visited the Calchaqui ruins near the poor village, went westward across the crest of the Cordillera de los Andes, and, turning again to the south-west across that dead region, reached Tinogasta, in the province of Catamarca, along the longitudinal valley. In 1876 I had reached the gorge of Belen, coming from Santiago del Estero, passing

by Catamarca, Pilciao, and Andalgala; and in 1895, penetrating from la Rioja, I examined the western valleys and the south of the high volcanic plateau, till I reached the place I had arrived at in 1893. I then returned to Tinogasta by the narrow gorge of Watungasta before mentioned, and thus am acquainted with nearly all the Calchaqui region, in which traces of that former American civilization may be seen to-day.

I do not think that the remains which are found in every part of that region all pertain to one race or to one epoch; but, on the contrary, they belong to many epochs and to different peoples representing many centuries of human settlement, the latest peoples being subdued by wild tribes who came from the east and south.

At the eastern foot of the mountains every day specimens of human culture are discovered, sometimes very deep, in the open ground close to the stream. Numerous hollows in the rocks show that long ago corn and algarroba beans were there pounded; burial-grounds are met everywhere, and their contents show not only reverence for the dead and their religious beliefs, but also great skill in pottery. Stone hammers and axes are very common, and animal forms carved in stone, sometimes in hard basalt. In the caves and rocky walls carved and pictured figures, still enigmatic, are preserved, and from time to time great boulders covered with the same are found. These evidences of a cultured and artistic people are more numerous in the valley near the town of Catamarca. The proofs of a large population are observed at once; from the old settlement of Chumbicha at the south end of the valley, to the Pucara at the base of Mount Aconquija, archæological discoveries are daily made, including objects in copper and sometimes in gold. The ruins of towns and villages are still visible, and when the traveller has reached the high hills of Singuil and arrived at the narrow gorge of Pucara, dominated by the extensive ruins of that name, he has passed across a country that once formed a continuous line of villages and busy towns, bordered at the two sides by massive mountains and defended at the extremity by the military posts of Chumbicha and Pucara. Pucara is undoubtedly the largest ancient fortress of Calchaqui, and I think that its purpose was to defend the valley of Catamarca and the western one from the invasions of the peoples of the eastern plains of Tucuman and Santiago, although it was unable to check them, according to old traditions. I have passed some days among these interesting ruins, the walls of which extend for nearly 2 miles, dominating by 1000 feet another valley situated to the north, enclosed by mountains, and where the remains of walls and agricultural grounds show that the population numbered tens of thousands. To-day the waters of the valley are scanty, and used only by a few descendants of the natives, possessing only a few goats and a little maize. In former times rains must have been frequent and water more abundant than it

is to-day, as there are still visible small grounds in the rocky slopes which have been cultivated by natural supplies and not by irrigation, which would have been impossible.

Passing from Pucará to the west across the dry abrupt chain of Ambato, is an extensive old lacustrine basin of 5000 square miles, bounded by mountains on the east, north, and west, and by low hills in the south. I visited the foot of the eastern side, and can say that the small water-supply existing to-day (scarcely sufficient for the needs of the small villages) would have been insufficient for the former large population. Their remains extend in every direction, even to the middle of the old lake, which is reduced to-day to some salt deposits, though flooded during the rainy season. It appears as if the settlements encroached on the lake during the process of evaporation, for in the bottom of this lake, in the middle of the wood of Algarrobos, is found the Ingenios of Pilcias and Constancia, where the rich copper of the mines of the northern mountains is smelted. The workers and woodcutters frequently brought to the establishment specimens of ancient industry, and discovered old settlements and burial-grounds in districts where now it is necessary to carry water for drinking purposes. Only in the north-east corner of this former extensively cultivated basin is any extensive cultivation to-day. In Andalgala the best wine of Argentina is produced, and other choice products. To the west of the lacustrine basin are the ancient settlements which bear to-day the names of Belen and Londres, and to the south-west the not less prosperous Tinogasta, closing the valley of its name.

This old lake received the waters of another basin to the north from the gorge of Belen. I have passed through it many times, and believe that it would be a good investment for an irrigation company to dam the water that passes through the gorge, giving back to the adjacent region its past agricultural activity. Extremely interesting are the small valleys near the northern entrance to the gorge, and there I have made collections which show how mixed were the people who inhabited this part in past times. At Yacutula I discovered in a burial-ground the extreme of the two human types, the most normal dolichocephalic skull and the most normal of the brachycephalic ever seen in Argentina; the first was that of a woman, probably a slave, whose bones were broken probably at the moment of death, and the second was the skull of a man, buried in a painted jar.

In La Puerta I found the most artistic black pottery now in the La Plata Museum, and a beautiful mortar adorned with two lizards. In San Fernando and Corral Quemado I had proof that the bronze implements which are frequent in the Calchaqui graves, were not foreign, but were smelted and cast on the spot; I discovered some casts and the slag from the melting-pot.

Hualfin contains one of the most important ruins in Catamarca; it

was the headquarters of part of the Calchaqui army, and the centre of a great agricultural district. Hualfin has been in that basin what Pucará, on the road between Andalagalá and Tucuman, was—the western fortified gate of the Calchaqui civilization. The slopes of the mountains that enclose the southern basin are rich in ruins of towns and villages. The western slope of the Aconquija is covered with them, and in the central valleys there have been discovered megalithic monuments which seem to have preceded those of Tiahuanaco, on the shores of Titicaca.

In the valley, and in the mountains that close it in to the west, are still more ruins of forts and towns, once agricultural centres. In every gorge, in the mountains, in every small valley at their foot, are seen ruins, and more ruins. I will mention only those of the Cajon ridge to the east and west, where nearly all the abrupt slope is covered with walls and steps, where the natives sowed their crops and protected themselves by numerous military posts and forts. To-day very little water runs at the foot. Famabalasto and Fuerte Quemado are steep ruins, the existence of which implies a much damper climate; so also do the remains of agricultural districts and towns of Santa Maria, Villarica and Jujuy, some in the low plains, others in the top of small tablelands, or “mesas,” all of them to-day cut by deep ravines. There we have a scenery which reminds me of what I have seen in the pictures from North-West Mexico and Arizona, and Dr. H. Ten Kate, my travelling companion in 1893, who had visited those regions and the ruins of the ancient civilization of the Shivi or Zuñis, was astonished at the similarity of the two landscapes, and the same characteristic features may be seen all over the north-west regions of Argentina.

In the neighbourhood of Santa Maria will be found the chief remains of the Calchaquis, and Fuerte Quemado is indeed the most interesting of its ruins; these are situate on the top of a precipitous hill, with steep access by a single narrow passage. The most extensive ruins are those of the ancient town of the Quilmes, a little to the north. Here are the stone walls of thousands of houses, overgrown to-day by cacti and bushes. The museums of La Plata and Buenos Aires have obtained excellent collections of specimens from these ruins. Tradition says that the Quilmes were not Calchaquis, but of Chilian descent, but I have seen no evidence to justify such a tradition. To the north of Quilmes, the traveller continues to meet with ruins at Colalao, Tolombon, Cafayate, Molinos, Payogasta and in every little village, or wherever there was a probability that man could settle.

Copper instruments have become more numerous in that part of the valley, as also in the vicinity of Salta and Jujuy. Calchaqui ruins in the west are found at Antofagasta de la Sierra and at Antofalla. In the valley of Antofagasta de la Sierra to-day there are scarcely fifty inhabitants. Antofalla is deserted; only occasionally an Atacama Indian

is seen there, keeping some goats and llamas, but in the time of the Calchaqui occupation an extensive population was located there. I visited the ruins of Antofagasta, and the photograph that I took gives a good idea of them, as well as of the barren aspect of the land to-day. There are small streams that empty themselves into a little lagoon at the foot of the two recent volcanoes, which spread their lavas in the middle of the lake, now nearly dry. The climate does not allow of any other cultivation, in very small patches, than a sort of clover, which is not indigenous, and which grows in extremely poor conditions. In the time of former settlements there were cornfields and irrigating channels, while among the ruins of the town, and in the black lava, I have discovered foundries and small melting-pots and broken casts for beautiful bronze disks.

In Antofalla one of my assistants made interesting discoveries of a Calchaqui settlement. Passing to the southern and northern region in the western volcanic region and in the valleys, the ruins and the burial-places are common in every part where waters existed in old times. Human settlements have been discovered at a height of 18,000 feet.

### III.

All that I have said in this paper shows how interesting is the anthropogeography of Argentina, and how many human problems are connected with the geography of the southern extremity of America.

First, we have the remains of man who lived when the continent had not acquired its present relief and contour; next, this man developing, commenced his migrations, while another man appeared in the regions of the west at the end of the Glacial epoch; and we have seen the old people pushed to the south, where to-day we meet their descendants, and amongst them we note an extraordinary variety of types never observed in any other country of the world. We see man living in caves with extinct mammals, as man lived in European caves of the Pleistocene period, and other people migrating from the northern extremity of the American continent. We find Polynesian anthropological elements mixed with the Patagonians; Polynesian culture amongst Calchaqui and old Peruvian culture. Advancing in time, we find a complicated civilization which is impossible to refer to any known type, yet presenting an astonishing similarity in some respects with that of people who lived in the same latitude in the northern hemisphere, and in a land of similar physical conditions. There is a remarkable analogy between the petroglyphs extending from Arizona to Patagonia, on both sides of the Andes, and between the industrial arts and myths. In intermediate countries there are identical analogies with races of the south and of the east. In Bolivia the ruins of Tiahuanaco and other similar ruins have no antecedents—the people to which they are referred, the one that used the macrocephalic deformation,

has its representatives from Vancouver to Patagonia. In the old Peruvian pottery the human types are not all those of the natives of to-day, but those of Patagonia, Tierra del Fuego, and Chile—in this same pottery Mexican types appear represented as prisoners. Several small artistic terra-cottas, so common in the old Mexican towns, have been discovered in the pampas of Buenos Aires, while other Mexican objects are the same as some of Calchaqui; Calchaqui remains extend from the Atlantic to the Pacific, and from Patagonia to Peru, and inter-Andean trade existed in those remote epochs, showing the enterprise of the peoples which maintained such relations across so great a barrier. When we remember all these facts, we cannot but believe that man has existed from a very remote period in South America, and that inter-continental and, more, interoceanic communications have been maintained from pre-historic times until the day that the Spanish conquistadores continued the work of the wild tribes in destroying the older prosperity when other civilizations commenced to decay.

Now, who are the Onas, the Tehuelches, the Gennakens, the Araucanians, the Misiones and Chaco tribes, the Calchaquis? It is impossible to answer this to-day. I have indicated the importance of these investigations in the hope that it may conduce to the solution of these problems, but I begin to think that we are already in presence of the elements which formed the old and lost civilization, the ruins of which are spread over the whole continent of South America. The anthropologist, treating of North America only, and ignoring what can be seen in South America, supposes that the latter continent was peopled by the races of the former, and that the ancestors of the Pueblos were also the founders of the old civilizations of Peru and Bolivia, but I think that the South American origins are the older, and that there is ample evidence to support my contention. I remember that the science of palæontology has demonstrated that the pampean mammals migrated from south to Mexico and the United States, and it is not impossible that men may have taken the same northward route. It is true that the mastodon is a European and North American mammal, but it is not to be forgotten that its remains are also abundant in South America, in beds of the same age as that of North America and Europe.

Undoubtedly the study of the geographical conditions of South America during the latter part of the tertiary age and the commencement of the pleistocene period will help very much to the solution of so many interesting problems.

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