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NOTES ON THE GEOGRAPHY OF THE ARGENTINE REPUBLIC.¹

By H. D. HOSKOLD, Director-General of the National Department
of Mines and Geology, Buenos Aires.

THE earliest information of the country now known as the Argentine Republic is due to Juan Diaz de Solis, who in 1508 discovered the mouth of the river Plate; a few years later, in 1526, Sebastian Cabot sailed for a considerable distance up the Parana. The fort which Cabot erected as a protection against the Indians, called on an old map in the possession of the writer—which will be referred to hereafter—Santo Spirito, or Torre de Cabot, was placed on the left bank of the river Plate, or as it was then termed, Rio de Paraguayr, and was situated in lat. $31^{\circ} 4'$.

The occupation of Paraguay, Parana, Uruguay, and that part of the continent now forming the Argentine and Bolivian Republics, by the Jesuit missionaries—the great civilisers of the Indians—did more to enlighten the world as to the importance and value of those inland regions than the work of all their predecessors. It is well known that they constructed maps of the various localities where they established stations; but the writer has not, unfortunately, obtained a sight of any referring to Argentina.

The oldest and most important map, known to the writer, which represents these regions in detail, was published in Paris in 1656, by N. Sanson de Abbeville, geographer to the king of France at that period. It embraces the territory between lat. $19^{\circ} 15'$ and 59° S., along a meridional arc of $39^{\circ} 45'$, and extends from east to west, over 112° of longitude, from the "Mer de Paraguayr" on the east to the "Sud Pacifique." The greatest breadth of land exhibited upon this map is apparently along a line drawn from a point on the coast of Brazil to the north of San Salvador de Todos os Santos in lat. $12^{\circ} 20'$ S., to a point on the western coast of Peru, also in lat. $12^{\circ} 20'$, and extends over $48^{\circ} 50'$ of longitude.

The river Plate, or Rio Paraguayr as it was termed in 1656, is exhibited as falling into the Mer de Paraguayr, at Cape San Antonio, a promontory marked to the south of Buenos Aires, in lat. 37° , not far from its true position. Buenos Aires is represented in lat. $33^{\circ} 48'$ S.; here was a Spanish fortress, together with a few other buildings, and the territory occupied by the Spanish colony at that period consisted of a very narrow strip of land upon the western bank of the river Plate, where a valiant tribe of Indians for a considerable period successfully resisted the encroachment of Europeans.

This colony, a narrow slip of land along the coast of Brazil, occupied by the Portuguese, the fort at Buenos Aires, and the land surrounding

¹ This paper was written for the Geographical Congress, 1895, in London, but was not received in time to be read. The changes which have taken place since then have necessitated a few trifling modifications, which are noted in their places.—ED.

the Jesuit stations were almost the only European possessions, the remainder of the north-western, western, and southern portions of the South American continent, up to lat. $12^{\circ} 12'$, being, according to the map, occupied by various tribes of Indians.

Paraguay, as it was then denominated, is represented as extending over the whole of the land now known as the Pampa, up to the mountain chains situated to the east of the Andes, and for a long distance northwards to the ancient limits of Brazil and Peru. On the north-west it touches Chile, and extends southwards as far as the "Terre Magellanique." The continuation of the continent southwards is called "Patagono," and its extremity "Terre de Feu ou Isles Magellanique." Cape Horn is placed in lat. $57^{\circ} 42' S.$, and the entrance to the Straits of Magellan in lat. $52^{\circ} 12'$. Various rivers are marked on both sides of the Rios de la Plata and Paraguay.

Don Samuel Lafone Quevedo published a map in 1883 showing the ancient boundaries of the territory belonging to the town of Londres (London) from 1633 to 1683, the site of which is now included in the province of Catamarca.

The extensive area of the modern Argentine Republic is bounded on the west by Chile and on the north by Bolivia. The frontiers are not yet exactly fixed, and will shortly be delineated by mixed commissions. On the north-east the Republic is separated from Paraguay by the rivers Paraguay and Parana.

The north-western boundary of Misiones, commencing on the river Parana in lat. $27^{\circ} 22' 30'' S.$ and long. $56^{\circ} 2' 30'' W.$, follows the tortuous windings of this river to a point in lat. $25^{\circ} 35' S.$ and long. $54^{\circ} 30' W.$ From this point the Argentine Republic claimed that the northern boundary line followed the windings of the river Y Guazú eastwards to the confluence of the river San Antonio-Guazú de Oyarvide, along which it ran southwards. This river joins the river Piquire Guazú, which falls into the river Uruguay, and the two formed the south-eastern limit of Misiones; but for a considerable time past a portion of the eastern area of Misiones had been claimed by Brazil, and the question was ultimately submitted to the arbitration of President Cleveland, of the United States of North America, who adopted the limits claimed by Brazil and apparently indicated in a treaty made between the Spanish and Portuguese Governments in 1750. Thus a considerable portion of Misiones has been lost to the Argentine Republic.

Henceforth, then, the eastern boundary of Misiones will commence on the south, where the river Pepiry-Guazú (Pepiry-Mini de Alvear) joins the river Uruguay in lat. about $27^{\circ} 9' S.$ and long. $53^{\circ} 50' W.$ The Rio Pepiry-Guazú rises in extensive mountain groups, the principal elevation of which appears to be in about $26^{\circ} 12' 50'' S.$ lat. and long. $53^{\circ} 39' W.$ From or near to this locality the mountain chains bear towards the north-west, and carry the boundary across the interval between the above river—the exact direction and distance being as yet undetermined—to a point in lat. $26^{\circ} 7' S.$ and long. $53^{\circ} 44' 30'' W.$ or thereabouts, where are the sources of the important river San Antonio. Winding in numerous curves and zigzags, the San Antonio flows on the

whole about N. $20^{\circ} 30'$ W. to its junction with the river Guazú, which is situated approximately in lat. $25^{\circ} 34' 30''$ S. and long. $53^{\circ} 59'$ W.

The mountain chains in which these and other rivers, such as the Rio Uruguay, Aguaray-Guazú, Piray-Guazú, Paranay-Guazú, etc., rise, have yet to be explored.

The general configuration of these elevated regions is such that the Rio Pepiry-Guazú flows southwards until it falls into the river Uruguay, while the Rios Aguaray-Guazú, Piray-Guazú and Piray Mini run westwards, and the river San Antonio follows a direction of about $20^{\circ} 30'$ W. of N. The higher ridges of the mountain chains run in a south-easterly direction, such as the Sierra del Iman, from which branch off a multitude of offshoots intersected by deep gorges and possessing similar hydrographic systems.

The part of Misiones still retained by this country—and it is extensive—is, for the most part, mountainous, and much of it is covered by dense tropical forests. The land, however, is very valuable and productive. Vast quantities of gigantic plants yield a fibre which can be fabricated into a material equal to silk in fineness and durability. The territory possesses great interest, for, when it is properly explored, it is highly probable that important geological, mineralogical, as well as hydrographical discoveries will be made, and at no distant time Misiones will doubtless become a great commercial centre.

The south-eastern portion of the province of Corrientes and the eastern portion of Entre Rios are divided from the Republic of Uruguay by the river of that name to a point in lat. $33^{\circ} 58'$ S. and long. about $58^{\circ} 23' 30''$ W. from where the river Uruguay falls into the river Plate. Thence the river Plate and the Atlantic Ocean bound the Republic as far south as Cape Dungeness, in lat. $52^{\circ} 23' 50''$ S. and long. $68^{\circ} 24' 20''$ W.

The Straits of Magellan territory was ceded to Chile by treaty. The remaining southern territory of the Republic, namely, part of Tierra del Fuego, commences at Espiritu Santo, in lat. $52^{\circ} 40'$ S. and long. $68^{\circ} 34'$ W. From this point the dividing line between the Argentine and Chilian territory runs directly southward to Beagle Channel.¹ Beyond this it proceeds eastward with many windings and then runs northwards to Cape San Diego, in lat. $54^{\circ} 40'$ S. and long. $65^{\circ} 7'$ W. The map published by the Geographical Institute of Buenos Aires shows the southern boundary line of the Argentine territory as traversing Beagle Channel eastward to lat. about $54^{\circ} 56'$ S. and long. $67^{\circ} 18'$ W., curving southward from this point so as to include Picton Island, New Island, and Staten Island.

It is very difficult to determine at present how the area of the Argentine Republic may be modified by the delineation of the boundary towards Chile. This boundary is now being traced, but it will not perhaps be transgressing the limits of propriety to make a few very general remarks on this most important question. The line will doubtless be regulated more or less by the position selected for the most northern

¹ This boundary was marked out by a Joint Commission in 1895.—ED.

frontier station, from which it will proceed southward. At present this station is near to the Pass of San Francisco, in the north-west of the province of Catamarca, and is said to be situated in lat. about $26^{\circ} 52' S.$ and long. $68^{\circ} 17' W.$

The map of the writer, published under the authority of the Argentine Government, by Messrs. Philip and Son, shows that the initial station is situated some eighteen leagues to the east of the old line, which has always been regarded as the boundary of the two Republics at this point. Competent authorities have calculated that this displacement alone will considerably reduce the area of the province of Catamarca in favour of Chile.¹

The Andine provinces, in order from north to south, are Jujuy, Salta, Catamarca, La Rioja, San Juan, and Mendoza; then follows an immense extent of land or national territory, divided into what are termed *Gobernaciones*, such as Neuquen, Rio Negro, Chubut, Santa Cruz, and Tierra del Fuego. A considerable portion of the area of these provinces, etc., is covered with chains of mountains running parallel to one another, and generally from north to south, parallel to the cordillera on the east: between these ranges and groups of mountains exist various elevated plateaus of great extent. The elevated regions are broken up into a multitude of ramifications running in all directions, and between these yawn deep, precipitous gorges or ravines, where the rays of the sun do not penetrate to the bottom all the year round; the almost inaccessible rocky crags around, and the general surface, constitute some of the wildest and grandest scenery imaginable, only to be equalled in other mountainous regions of South America. The conditions of climate and the rarefied atmosphere are exceedingly favourable for scientific observations. The great Andes may be considered as the backbone of the South American continent, and in the Andine provinces also are various points of great elevation.

PROVINCE OF JUJUY.

This province is the most northern of the Argentine Confederation; the capital, of the same name, is situated in lat. $24^{\circ} 11' S.$ and long. $65^{\circ} 21' 30'' W.$, at an altitude of 4144 feet above sea-level, and is distant 1015 miles from Buenos Aires.

On the north Jujuy borders on Bolivia, and its north-western portion on a tract of land recently ceded to this Republic by Bolivia. On all other sides it is surrounded by the province of Salta. The total area of the province is 19,760 square miles, and its population 49,543.² The greatest altitudes of the mountains, as far as recorded, range from 9680 feet at Estaca to 11,150 at Tagareta, and 18,000 in the Sierra Aguilar. The lowest spots known are in one of the valleys at Isla, near Carmen, 1480 feet, and at Quebracho, near the Rio Negro, where the altitude is

¹ In the Treaty of April last there is no stipulation regarding the removal of the San Francisco pillar.—ED.

² These figures, as well as the areas and populations of the other provinces, are results of the last census, in May 1895.—ED.

1300 feet. The province is rich in minerals, such as copper, silver, gold, lead, antimony, etc., some of which have been exploited.

PROVINCE OF SALTA.

The capital of the province, of the same name, is situated in lat. $24^{\circ} 45' 40''$ S. and long. $65^{\circ} 23' 45''$ W., and has an altitude of 3840 feet above sea-level, and is 974 miles from Buenos Aires. The province extends over an area of 63,168 square miles, and has a population of 118,138.

To the east of the province of Jujuy the province of Salta is limited by Bolivia, to the east and south-east by the Gobernaciones of Formosa and the Chaco, to the south by the provinces of Tucuman and Catamarca, and to the west by the tract of land previously referred to as recently ceded to this Republic by Bolivia.

The highest mountains are the Nevada de Cachi, 21,300 feet; Cuesta de Acay, 13,100 feet; and the Nevada de Acay, 15,700.

The lowest points are at Chilcas, 2260 feet; Rio de las Piedras, Miraflores, 2395 feet; and Rosario de la Frontera, 2431.

This is one of the most important of the northern provinces, being noted for its mineral wealth. Many mines of copper, gold, silver, lead, antimony, bismuth, and borates exist, some of which are exploited.

PROVINCE OF CATAMARCA.

The capital of Catamarca is situated in lat. $28^{\circ} 25'$ S. and long. $65^{\circ} 45'$ W., and stands 1667 feet above sea-level. On the north the province touches the tract which was formerly Bolivian territory; to the north-east lie the provinces of Salta and Tucuman; then on the east follows the province of Cordoba, while La Rioja skirts it on the south and south-west, and Chile on the west. The area of 32,671 square miles is occupied by a population of 90,187. The mountain termed Cerro Nevada Boneti, situated in lat. $27^{\circ} 55'$ and long. $68^{\circ} 53'$, has an altitude of 19,700 feet. It is, however, disputed whether it belongs to this province or to La Rioja. Peñasco de Diego, in lat. 28° S. and long. $69^{\circ} 17' 30''$ W., has an altitude of 20,100 feet.

Various mountain chains, almost parallel to one another and to the Andes on the west, cover a very large area. On the eastern side of the province are other ranges, of which one of the culminating points is Aconquija, situated in lat. $27^{\circ} 20'$ S. and long. $65^{\circ} 50'$ W., with an altitude of 15,394 feet. It is on the frontier line of Tucuman. The south-eastern part of the province is also very mountainous, the principal range being a southward continuation of the Sierra de Aconquija, called Sierra de Ambato. Another mountain elevation still farther to the east is the Sierra de Ancasti. The very extensive plain of Santa Maria separates the mountains of Capillitas from that part of the Sierra de Quilmes which is situated in this province. It is in the Sierra de Capillitas that the principal copper and silver mines are found; but a large number of

mineral deposits are scattered through nearly all the mountain chains of the province.

Several nearly level camps of great extent lie between the principal mountain groups, such as that extending from Fiambala—5020 feet above sea-level, and in lat. about $27^{\circ} 53'$, long. $67^{\circ} 32' 30''$ —to lat. $27^{\circ} 6' 30''$ and long. $67^{\circ} 45'$. The soil of this camp, from Medanito northwards, consists of finely pulverised pumice or volcanic ash of great depth. On an old river-bed in this neighbourhood is exposed a thickness of 100 feet, and probably in other points it is much more. The camp is here covered with short, thorny shrubs or brushwood, and it is one of the most arid and inhospitable deserts in the Republic the writer has travelled over. The feet of the mules often sink several inches into the fine pumice powder at each step, which, together with the scorching rays of a tropical sun, makes travelling far from agreeable. On one occasion the writer was fourteen hours in crossing this plain. Much attention has been given to the cultivation of the vine, and a fine quality of wine is produced.

PROVINCE OF LA RIOJA.

The town of this name, and the capital, is situated upon the edge of a very extensive plain or camp running into the province of Cordoba, and at the base of the mountain called Cerro de Velazco, in lat. about $29^{\circ} 20'$ S. and long. $67^{\circ} 1' 11''$ W., and is 1650 feet above sea-level, and distant 764 miles from Buenos Aires. The province has an area of 31,621 square miles, and a population of 69,228.

One of the principal groups of mountains is that of Famatina, which, according to the map of the Geographical Institute of Buenos Aires, commences at Paganzo, in lat. about $30^{\circ} 10'$ S. and long. $67^{\circ} 22' 30''$, extending northwards to $28^{\circ} 28' 31''$ S. lat. To the west these mountains spread out to the margin of the great valleys of Vinchina and Hermosa, which extend to the northern extremity of the province, and southward to the provinces of San Juan and San Luis.

To the east of the Cerro Negro the valley or large plain of Famatina divides this group of mountains from the Cerro de Velazco, which from an open plain at the Colorados extends northwards to lat. $28^{\circ} 32'$ S. This cerro has an altitude of 11,500 feet, and from lat. 29° S. and long. $67^{\circ} 23'$ W. sends out its ramifications as far as long. $66^{\circ} 30'$. Its extreme eastern branch runs in a north-eastern direction to join the Cerro de Ambato in the province of Catamarca. On the western side of the valleys of Vinchina, Hermosa, etc., other mountain chains extend westwards to the cordillera, intersected by valleys such as those of Jagüel, Tambillos, Guandacol, etc.

The highest mountain in the Cerro de Famatina is the Nevado, 20,650 feet, situated in lat. 29° S. and long. $67^{\circ} 40'$ W. The Cerro Negro has an altitude of 14,760 feet, and the Cerro de la Mejicana is still higher.

The principal mining centre of the province is Chilecito, or Villa Argentina, in lat. $29^{\circ} 8' 30''$ S. and long. $67^{\circ} 39' 30''$ W.; it stands

3537 feet above sea-level, and is 768 miles from Buenos Aires. The great valley commencing to the north of the town of Famatina, upon which Chilecito is situated farther south, slopes southwards to the province of San Juan, as is shown by the levels, Nonogasta, seven and a half miles south of Chilecito, being 3117 feet above sea-level, and Vichigasta, twenty-one miles south of the same town, only 2789. Towards the south-eastern portion of the province other mountain groups occur, such as the Cerros de los Llanos, etc.

The principal silver mines occur in the Cerro Negro district, and those of gold, silver, and copper in the Cerro de la Mejicana, etc. etc. Nearly all the mountains of this province are metalliferous. Viticulture is carried on to a considerable extent, as also the breeding of stock.

PROVINCE OF SAN JUAN.

The town of San Juan, capital of the province, is situated on the western edge of a large plain, at about nine miles from the base of the range called Sierra de Zonda, in lat. $31^{\circ} 31' S.$ and long. $68^{\circ} 30' 30'' W.$, and at an elevation of 2090 feet above sea-level. The province extends over an area of 36,682 square miles, and has a population of 84,251. It borders the province of La Rioja on the north and north-east, San Luis on the south-east, and Mendoza on the south; to the west it skirts the cordillera. The height of the mountains ranges from 13,000 to 23,000 feet, and nearly the half of the province is covered with chains.

East of the principal mountain groups stretch almost level plains called *Travesias*, e.g. the Travesia del Bermejo to the east of the Sierra Pie de Palo, 8200 feet high, entirely surrounding the Cerro Blanco and Sierra de la Huerta, and extending to the limits of the provinces of San Luis and Mendoza, and from the town of San Juan northwards to the Travesia del Zanjón; still farther north it unites with the Travesia de Magna. It is also prolonged on both sides of the Rio Bermejo to the northern limits of the province, where it narrows to the west and joins the Travesia of Guandacol, in the province of La Rioja. To the west of the Sierra de Billicun lies the Travesia de Matagusanos, extending northwards until it meets the northern extension of the Travesia de Magna, and southwards to a point in lat. $31^{\circ} 28' S.$ and long. about $68^{\circ} 45' W.$ This travesia is joined by breaks in the mountains to others farther to the west, the principal of which commences on the Rio Castaño in lat. $31^{\circ} 9' S.$ and long. $69^{\circ} 32' N.$, extending northward to Palaca, 6890 feet above sea-level, in lat. $29^{\circ} 27' 30'' S.$ and long. $69^{\circ} 24' W.$ The greatest width of the travesia is from Guardia, at the base of the western mountains, to Iglesia, where it is twenty miles.

This is one of the most important of the Andine Federal provinces, possessing a large number of gold, silver, copper, and other mines, some of which are exploited. It has a very considerable area under cultivation, and much attention is given to viticulture and the raising of stock. It has some very large rivers, which become at times very rapid. Not long ago the town of San Juan and others in the province suffered from the effects of violent earthquakes.

PROVINCE OF MENDOZA.

This province skirts the cordilleras from San Juan down to the Gobernacion of Neuquen. The town of Mendoza, the capital, is situated in lat. $32^{\circ} 53' S.$ and long. $68^{\circ} 48' 55'' W.$, at an altitude of 2493 feet above sea-level. Its area is 57,203 square miles, and population 148,160. The highest mountain is the Aconcagua in lat. $32^{\circ} 40' S.$ and long. $69^{\circ} 57' 30'' W.$ Its height has been variously estimated. Pissis gives 22,913 feet; Guessfeldt, 22,867; Fitzroy, 22,939; Reche, 22,913. Recent observations give 22,965 feet as the height.¹

Ave-Lallemant—and there is no better authority—states that the position of the Pyramid in the Cerro Blanco de Paramillo is in lat. $32^{\circ} 28' 47.88''$ and long. $69^{\circ} 7' 30.98''$, and that its height is 9390 feet. Tupungato is placed in the map of the writer in lat. $33^{\circ} 22' S.$ and long. $69^{\circ} 48' W.$; others, however, have given it a different position. Its height has been estimated at 22,000 feet; but, for the map referred to above, 20,300 was chosen as probably nearer the truth. The Cerro Overo, farther south, attains an elevation of 15,550 feet; the Cerro Colorado has an altitude of 6135 feet; and La Silla of 5938 feet.

This province contains immense plains such as Travesia Grande del Tunuyán, which runs northwards beyond the limits of the province into the province of San Juan, and southward to join the Pampa de la Varita, passing into the Gobernacion de la Pampa. Along the parallel of 34° , from the base of the Cerro Guadal and the Cerro Guaiqueria to the Rio Desaguadero, this plain has a width of 104 miles. More to the south, and between the mountains, other camps exist, such as Pampa del Sur and Pampa de la Matanzilla, and others.

Gold, silver, and copper deposits are to be found in nearly all the mountain ranges, some of which are being exploited, such as the mines of Uspallata. Petroleum also is obtained from the wells at Cacheuta, and there are seams of good coal in the department of San Rafael. Much attention is given to agriculture, viticulture, and cattle-breeding. The rivers of the province are rapid at certain seasons of the year.

GOBERNACION DEL NEUQUEN.

The capital of this Gobernacion, or national territory, is Chosmalal, in lat. about $27^{\circ} 26' 45'' S.$ and long. $69^{\circ} 50' W.$ The town stands 2628 feet above sea-level. The territory lies between the province of Mendoza on the north, and the Gobernaciones of the Pampa Central and Rio Negro on the south and east, and skirts the cordillera on the west. It has an area of 35,685 square miles, the greater portion

¹ News has lately been received that Zurbriggen, the Swiss guide who is with Mr. FitzGerald, has reached the summit, and found it to be more than 24,000 feet above sea-level. Aconcagua is, then, the loftiest mountain in the New World, surpassing Mount Logan, and it is the highest peak in the whole World ever trod by the foot of man. Mr. FitzGerald was prevented by illness from ascending higher than 23,000 feet, but intended to make another attempt.—ED.

being covered by mountains. The extinct volcano Copahué has an altitude of 13,000 feet, and its crater is occupied by a lake.

The region has not been thoroughly explored; but its lakes and hot springs and large rapid rivers are celebrated. Gold, silver, copper, lead, and coal mines abound, and the first-named metal is worked. The climate is exceedingly good, and the inhabitants devote themselves to agriculture and stock rearing.

GOBERNACION DEL RIO NEGRO.

Situated between Neuquen and Pampa Central, Chubut, the province of Buenos Aires, the Atlantic Ocean, and Chile, it extends over an area of 80,067 square miles. Comparatively, it is not very mountainous; the principal elevations are situated between lat. $40^{\circ} 35'$ and $42^{\circ} 30'$, joining the cordillera on the west, and spreading to long. $70^{\circ} 42' 30''$ W., and rising to heights of 40,350 to 8200 feet. Several lakes lie among the mountains and at their skirts. One of the principal is Lake Nahuel-Huapi, extending from lat. $40^{\circ} 37' 30''$ to $41^{\circ} 32' 30''$ S., and 2030 feet above sea-level. A large portion of this Gobernacion is arid, and is dotted over with hills of slight elevation. However, along the river valleys, and where water is found, the land is exceedingly fertile. Many parts are capable of irrigation and high cultivation, and are excellent for stock raising. To the extreme south-east is situated the Sierra General Roca, and, near to the coast, the Sierra Antonio. The mountains have not been scientifically explored.

GOBERNACION DEL CHUBUT.

This territory stretches from the parallel of 42° to the Gobernacion of Santa Cruz on the south, and from the cordillera to the Atlantic Ocean. Its area is 96,175 square miles. Rawson, the capital, stands near the coast, in lat. $43^{\circ} 18'$ S. and long. $65^{\circ} 15'$ W., at a height of 279 feet above sea-level.

The principal colony has been formed by Welshmen, who cultivate a considerable area of land. From this locality westward is an extensive arid tract; the western part, however, is fertile, covered with strawberry fields and splendid grass, with fruit and forest trees, and is traversed by wide and rapid rivers. Near to the Andes it is very mountainous, the lower part being well wooded; but these regions have not been thoroughly and scientifically explored. One of the highest points is in lat. $42^{\circ} 50'$ and long. $72^{\circ} 32' 30''$. Mount Yanteles also is 11,980 feet high. Towards the south the mountains decrease to about 3300 feet in height. Lakes Fontana and Musters are named after their discoverers. Expeditions organised to examine a portion of this territory have discovered gold and other mines. The colony 16th of October, in the north-western portion of the Gobernacion, was also founded by Welshmen who are engaged in agricultural pursuits. It is a fine grazing country, and many persons are engaged in raising stock. The principal produce in the original Welsh colony is wheat.

GOBERNACION DE SANTA CRUZ.

The boundary between this territory and the Chubut is marked by the parallel of 46° ; thence Santa Cruz extends southward to the parallel of 52° on the meridian of 70° ; the boundary line then passes round Cape Dungeness to the cordillera.

The western mountains diminish in breadth as they approach the Straits of Magellan. Mount Valentine, in lat. $43^{\circ} 30'$ and long. $73^{\circ} 12' 30''$, has an altitude of 12,700 feet. Mount Stokes, in lat. $50^{\circ} 30'$ and long. $73^{\circ} 8'$, rises to 6400 feet, while Mount Payné, still further south, is only 5800.

In the northern portion of this territory, to the east of Mount Valentine, the Pico Sur has an altitude of 4660 feet; and in lat. $48^{\circ} 3'$ and long. $72^{\circ} 9'$ stands Mount Belgrano with only 3800 feet, and Mount Morgan, in lat. $50^{\circ} 30'$ and long. $72^{\circ} 12'$, with 3250. And again, Mount Aymond, lat. $52^{\circ} 16'$ and long. $69^{\circ} 20'$, has an altitude of 1000 feet. Thus it is seen that the mountains diminish in height towards the south. In fact the whole surface slopes southward as well as eastward. The Gobernacion is well watered by various rivers; the mountain regions have not been properly explored. The land is very fertile and adapted to agricultural and grazing purposes.

GOBERNACION DE LA TIERRA DEL FUEGO.

The limits of this territory have been previously given. It extends over an area of 8038 square miles. Ushuaia is the chief town, and the seat of local government.

The late lamented explorer, Popper, made various discoveries in this region, the principal being gold washings along a portion of the coast. When the precious metal has been exhausted by the miner, the supply is renewed by the sea, which in tempestuous weather washes up on to the coast magnetic iron sands mixed with gold. Certain islands to the south, previously noted, are included in this Gobernacion.

The western part of Tierra del Fuego, in the possession of Chile, is very picturesque, the valleys being well supplied with water and timber. Here also a considerable quantity of gold is annually obtained.

The islands in the Straits of Magellan, as well as the mainland surrounding it, are covered with forests, which continue more or less northwards to the Gobernacion described above.

The Central and Eastern Federal Provinces are San Luis, Cordoba, Tucuman, Santiago del Estero, Santa Fé, Corrientes, Entre Rios, and Buenos Aires.

THE PROVINCE OF SAN LUIS

is situated between those of San Juan, La Rioja, Cordoba, Mendoza, and the Gobernacion of the Pampa Central, extending over an area of 28,640

square miles, and with a population of 81,155. The north-eastern part is mountainous, and the highest point is considered to be Tomalasta, situated in lat. about $32^{\circ} 49'$, long. $66^{\circ} 5'$, with an estimated altitude of 6945 feet. The plains in this province, such as the Travesia Puntana and others, are of enormous extent.

The capital, San Luis, is situated at a distance of 478 miles from Buenos Aires. Seventeen miles west of the town a boring has been made for water, at a place called El Balde (1447 feet above sea-level), to a depth of 1970 feet, where a gravel bed was found, the water from which rose to the surface. It is a curious fact that all the rock bored through was indurated marl or mud, with a few thin bands of sand and gravel, and reddish friable sandstone of recent formation. Some auriferous deposits have been exploited, and there are other mines of gold, silver, copper, lead, manganese, and marble. Agricultural pursuits and grazing employ many of the inhabitants.

PROVINCE OF CORDOBA.

This is the most central province of the Republic, and is situated between those of San Luis, La Rioja, Santiago del Estero, Santa Fé, Buenos Aires, and the Gobernacion of the Pampa Central, extending over an area of 66,720 square miles, with a population of 351,745. The city of Cordoba is in lat. $31^{\circ} 25' 15''$, and long. $64^{\circ} 11' 16''$, and is 1440 feet above sea-level. The mountains of the province are situated, for the most part, between the parallels of lat. $29^{\circ} 35'$ and 33° , and in their widest part extend from long. $64^{\circ} 7' 30''$ to $65^{\circ} 30'$. The highest summit recorded on the Institute map is Cerro Champaqui, 9350 feet. Oveja, in the Sierra Comechingones, is 7237 feet. Cerro Gigantes, farther to the north, has a height of 7710 feet; while the Cerro "Minas" does not exceed 5580 feet, and others are still lower. There are extensive plains here, some of which lie not more than 650 feet above sea-level. The lower hills are covered with trees, grass, etc.; the valleys are well watered, and the scenery very picturesque. As regards mines and farming, the same remarks apply to this as to the preceding province.

THE PROVINCE OF TUCUMAN,

situated between Catamarca, Salta, and Santiago del Estero, is the smallest of the Confederation, having an area of only 8482 square miles, with a population of 215,693.

In the north-west, from lat. $26^{\circ} 5'$ to 28° , Tucuman is very mountainous: on the western boundary stands the Sierra de Aconquija, referred to under Catamarca, and another range runs westward to the Sierra de Quilmes. The mountains diminish in height eastward. The altitude of the town of Tucuman is 1476 feet, and its distance from Buenos Aires is 786 miles. The railway from Tucuman, northwards, rises to an altitude of 2700 feet at the station Tala.

The cultivation of the sugar-cane is carried on to a large extent, and

other agricultural pursuits are extensively developed. Part of the province is covered by forests and exceedingly well watered. Several of the mines of gold, silver, and copper were worked in ancient times, but no mining industry is at present carried on.

PROVINCE OF SANTIAGO DEL ESTERO.

Lying east of Tucuman and Catamarca, between Salta and the Gobernacion del Chaco on the north, and Cordoba on the south, the province includes an area of 36,138 square miles, with a population of 160,445. The town of Santiago is situated in lat. $27^{\circ} 48' 2''$ and long. $64^{\circ} 15' 2''$, at a distance from Buenos Aires of 745 miles, and stands 610 feet above sea-level.

With the exception of the Sierra de Guasayan, and the Cerros Colorados, Ambargasta, and Sumampa—the culminating point of which is only 600 feet high—there are no mountains of any extent. Most of the province consists of almost level plains, partly salt pans (*Salinas*). Forests cover the border towards the Gobernacion del Chaco. The land is rendered exceedingly fertile by a system of irrigation. Viticulture and sugar-cane industries are considerably developed. Large quantities of wheat and Indian corn, clover and tobacco are produced. No traces of ores have been discovered, but marble and sandstone occur in abundance. One of the largest meteorites in the world is to be seen in this province.

PROVINCE OF SANTA FÉ.

This province lies to the west of Santiago del Estero, and is bounded on the east by the river Parana. It has an area of 51,080 square miles. The port Rosario, on the Rio Parana, stands in lat. $32^{\circ} 56' 41''$ and long. $60^{\circ} 39' 3''$ W., and is 128 feet above sea-level. A large amount of shipping visits the port, and the province is noted for its numerous and prosperous settlements. Agriculture and cattle-breeding are the chief industries. A large quantity of grain and wool is annually exported. There are no mountains in this province. Whether it contains minerals is yet unknown.

PROVINCE OF CORRIENTES.

South of the Parana, which divides it from the Republic of Paraguay, lies Corrientes, extending to the river Uruguay on the east, covering an area of 32,879 square miles, and inhabited by 239,570 souls. The capital is in lat. $27^{\circ} 27' 55''$ and long. $58^{\circ} 49' 6''$, at an elevation of 220 feet above sea-level. The principal products are sugar, corn, wool, and clover.

The country is almost level, with lakes in the lowest parts.

PROVINCE OF ENTRE RIOS.

To the south, Corrientes is succeeded by Entre Rios, lying, as its name implies, between two rivers, the Parana and the Uruguay. It has an area

of 2863 square miles and a population of 290,994. The surface is undulating, and water is abundant, the province being in this respect one of the most favoured. The town of Parana is in lat. $31^{\circ} 43' 45''$ and long. $60^{\circ} 31' 19''$. Small steamers run daily from this town to Rosario. Agriculture is the principal industry.

PROVINCE OF BUENOS AIRES.

This large and important province, with a long Atlantic sea-board, and extending down to the Rio Negro Gobernacion, has an area of 117,262 square miles, and a population of 1,585,079 (Buenos Aires city included).

Buenos Aires, the capital and seat of the national Government of the Argentine Republic, is the great maritime port. The geographical position of this city has been variously calculated. Ten authorities have fixed the lat. from $34^{\circ} 36'$ to $34^{\circ} 36' 29.8''$ and the long. from $58^{\circ} 16' 19''$ to $58^{\circ} 23' 24''$; but the director of the National Observatory of Cordoba, Dr. Thome, gives the lat. at $34^{\circ} 36' 31.4''$ and the long. at $58^{\circ} 22' 15''$ west of Greenwich. The city has an elevation of sixty-six feet above the sea-level. All the principal towns of the Republic are in communication with Buenos Aires by railway and telegraph lines. It is an agricultural province, producing an abundance of grain, stock, wool, and all kinds of vegetables and fruits. The chief town of the province is La Plata, where there is a fine port.

A few other extensive but thinly populated districts remain to be noticed. First there is the

PAMPA CENTRAL,

covering an area of 56,336 square miles to the west of the province of Buenos Aires. General Acha, the capital, is situated in lat. $37^{\circ} 22' 30''$ and long. $64^{\circ} 39' 30''$, and is 732 feet above sea-level.

The surface of the Gobernacion is undulating, and in part covered with woods, low hills, and fertile camps and valleys. Limited areas are cultivated, and stock is raised. Lakes have been formed in the depressed parts, a few of which are saline.

The mountains are only 7200 to 7700 feet high. Copper ore has been discovered and some mines opened, but the commercial value of these is still uncertain.

GOBERNACION OF FORMOSA.

At the north-eastern limit of the Republic, and bordering on Paraguay, is the Formosa territory, 45,560 square miles in area. The town of Formosa is situated in lat. $26^{\circ} 12' 40''$ and long. $58^{\circ} 4' 50''$; authorities, however, differ slightly in reference to the position. The altitude above sea-level is 121 feet.

A portion of this territory is well watered by rivers and susceptible of high cultivation. A considerable area is covered by forest.

THE GOBERNACION DEL CHACO,

south-west of Formosa, extends over an area of 53,328 square miles. Forests are spread over an extensive area of this Gobernacion, and companies are utilising the timber. Minerals are not known to exist either in Formosa or the Chaco.

The Argentine Republic contains fourteen federal provinces, each having a local government of its own, and nine Gobernaciones or National Territories under the direct control of the National Government. According to recent data, the total area of the Republic is 1,111,079 square miles and the population 4,043,000 (1895).

The central Pampean regions are devoid of forests in the proper sense of the term, but a good deal of useful timber is scattered here and there through the Andine and northern provinces; the uncultivated camps for the most part produce only brushwood here and there.

The great forests are to be found in the Gobernaciones of Misiones, the Chaco, and part of Formosa, as also in the low level camps which run parallel with the higher mountains in the Andine Gobernaciones, extending, with some breaks here and there, to the extreme southern portion of the Argentine and Chilean territories. In a few places the mountain chains are broken up by deep gorges in which rivers run, and along their slopes are large areas of land susceptible of high cultivation and generally covered with forest trees.

Twenty-nine passes have been recorded as penetrating the mountain ranges from Argentine territory through the Andes towards Chile. They are distributed throughout the range from the extreme northern to the southern boundary of the Republic, and their altitudes range from 2700 to 15,000 feet; few, however, are used.

The Malvina or Falkland Islands are always placed upon Argentine maps as claimed by this Republic, although they are still occupied by the English.

Although nearly all the territory of the Argentine Republic lies in the temperate zone, still its general configuration, taken in connection with its great meridional extension, points to the conclusion that there is a considerable variation of climate within its limits. The temperature in Buenos Aires during the winter months cannot be considered severe, nor the summer season oppressively hot, except for a few days at a time, owing to the influence of the river Plate and the Atlantic Ocean; but if we were to travel westward in the same parallel of latitude, we should at length cross some of the higher mountains in the province of Mendoza, where, during the winter season, the cold is intense, while the heat of summer is modified by the height and the currents of air. Hence almost any desired climate and temperature may be secured.

Many of the larger open and unprotected camps, or elevated plateaus, previously described as running north and south, parallel with the mountain chains, have a soil of pulverised sand mixed with alluvial earth, and sometimes fine pumice or volcanic ash, and during the hot season the

heat, accumulating here from the rays of a tropical sun, is so intense that travelling is far from agreeable, nay, even dangerous. The early morning is generally selected by travellers.

The Republic may be divided into three great zones, namely, the littoral, including Buenos Aires, Santa Fé, Entre Ríos, and Corrientes; the middle Pampean and extreme northern and southern camps; and the great elevated Andine region.

Geodetical operations have not yet been instituted in a systematical manner in the Republic; consequently some of the geographical positions which have been given may be slightly in error.

This paper is only intended to deal with some of the more prominent geographical features of this great country, and therefore minute details have been avoided.

PROCEEDINGS OF THE ROYAL SCOTTISH GEOGRAPHICAL SOCIETY.

NEW MEMBERS.

At a meeting of Council held on January 11th, the following ladies and gentlemen were elected Members of the Society :—

Cockburn, Miss.
Dalmahoy, Miss F.
Davidson, Miss M. A.
Gray, Mrs. A. R.
Stewart, Miss E. S.
Allan, Jas. A.
Bruce, Patrick C.
Gavin, Robt. D.
Luke, Dr. Jas.
M'Gregor, A. Wallace.
Matthew, P. M.

Mavor, Henry A.
Murdoch, Thomas.
Murray, Andrew.
Murray, John.
Stewart, R. K.
Verney, J. Hope Lloyd.
Watson, Charles.
Watson, Richd. M.
Watt, James.
Webster, J. H. D.
Wylie, Robert.

—In all twenty-two.

LECTURES DELIVERED IN JANUARY.

In Edinburgh, on January 14th, Commander A. F. Balfour, R.N., delivered a lecture entitled, "Remarks on a Surveying Cruise in the Solomon Islands, 1893-94." Professor Geikie presided.

On January 18th Commander Balfour addressed the Glasgow Branch, the Chair being taken by Mr. Robert S. Allan.

Dr. Zaytoun lectured in Edinburgh, on January 28th, on "Cape Juby and the Western Sahara." Viscount Dalrymple was the Chairman.

On January 27th Dr. Zaytoun addressed the Aberdeen Branch on the same subject, on which occasion Mr. James Spence presided.

The first set of three lectures on the "Unity of the Empire," by Professor John Kirkpatrick, LL.D., were delivered in the Society's Hall.