

but it is easy to see which side of the controversy he would espouse if he felt himself free to give his opinion.

His brochure is richly embellished by numerous beautiful plates of mountain chains, scenery around the lake districts and along the Andean foothills, taken from the Argentine "case," as presented to the Arbitrator, in five large folio volumes. He also reproduces several Argentine Government maps on a reduced scale.

M. Gallois sets forth the salient features of the various treaties and protocols which have, during a score of years, resulted from this question, and he justly regrets that "La formule que les diplomates adoptèrent fut donc tout simplement la formule traditionnelle." "S'il y avait un pays au monde où les vieilles formules dussent être avec soin évitées, c'était la Patagonie." In this opinion he is not alone, for every student of South American politics and geography must lament the interminable blunders made by diplomatists and lawyers when they rely upon their own language to determine frontier lines instead of submitting their description to scientific experts.

M. Gallois especially criticises the ignorance of the framers of the treaties regarding rivers which eat back until they have established their determined vertical curve of equilibrium. Herein is the crux of the whole dispute between the Argentine Republic and Chile. The former claims that the boundary line should be traced along the highest crests and peaks of the main Andean chain; and the latter claims that the treaties demand the tracing of the line along the continental *divortia aquarum*. But some of the rivers which flow into the Pacific Ocean have sawed back through the Cordillera and now have their sources upon the Patagonian plateau to the east of the Andean main chain. Thus the rival claims are in direct conflict. Many cases of this tendency of rivers may be found in almost every country in South America, and Colonel Church, in his "Physical Geography of South America," has given us numerous instances of it, especially in Ecuador, Perú, and Bolivia.

The brochure has a laconic but excellent description of Patagonia in a few pages, and gives due credit for information to Chilian as well as Argentine explorers. A long line of cliffs borders the Atlantic coast, interrupted at rare intervals by great valleys which open on to the sea. The surface of the immense Patagonian plateau rises gradually towards the west up to the vicinity of the Cordillera. Here and there a depression is filled with saline waters, and, especially towards the south, the country is covered with immense sheets of basaltic lava. Deep valleys, too immense for the existing streams of water, cut the plateau in certain parts and have a labyrinth of affluent cañons.

"The aspect rapidly changes along the approaches to the Cordillera. . . . It is a broken region, often mountainous, rich in prairies; rich, above all, in sheets of water, the smallest of which equals the area of our great European lakes. A privileged country, where the climate is free from extremes, where moisture is sufficient, where forests, easily penetrated, adorn the mountain sides. It is there that Argentine colonisation has been developed, and also *there* are the disputed territories.

"More to the west, but without the transition being suddenly established, commences what we call, without prejudging anything, the main chain.

"The Cordillera drops suddenly to the sea from 42° south latitude. Up to 47°, it dominates a long submerged depression which visibly continues the interior plain of Chile. . . . Further to the south the outline is less defined."

He notes the marked resemblance of this Pacific coast to that of Alaska and Norway—scored and penetrated by fjords and channels cutting the coast-line into islands and presenting numerous glaciers. Many rivers find their way to the Pacific Ocean through deeply carved valleys in the Cordillera, but so violent and broken in their course that none of them are navigable except for a very short distance from the sea.

Such is the outline that M. Gallois gives of Patagonia, and it enables the reader to acquire a very fair general knowledge of the orography and topography of the country without studying the voluminous works which have been prepared for the empires in the boundary-line dispute. It is to the credit of M. Gallois that, however difficult, he has found it possible to preserve an impartial attitude in his instructive and ably-written brochure.

G. E. C.

#### WIRELESS TELEGRAPHY.

*Wireless Telegraphy.* By G. W. de Tunzelmann. Pp. iv + 104. (London: Office of Knowledge, 1901.) Price 1s. 6d.

MR. DE TUNZELMANN, in writing a popular account of wireless telegraphy, has attempted the double task of describing its historical development and of giving an account, which shall be intelligible to the lay reader, of the fundamental principles of the subject. The descriptive parts are based mainly on the papers which have been read by Mr. Marconi, and explain in an interesting manner free from superfluous detail the system which he has worked out. It is to be regretted that the work of other experimenters is hardly adequately recognised; Prof. Slaby, for example, deserves more than the half dozen lines allotted to him. Moreover, such information as is given is easily accessible in Mr. Marconi's published papers, whereas a careful comparison of the systems devised by the various workers would be a valuable addition to the literature of the subject.

In the theoretical portions of the book the author has largely drawn his inspiration from Prof. Lodge's "Modern Views of Electricity." Without wishing in any way to disparage Mr. de Tunzelmann's explanations, we doubt whether they would be intelligible to readers who, as he says in the preface, "know little or nothing of electrical theory." A clear comprehension of the constitution of the ether and the mechanism of ether waves is not to be obtained without serving a long and severe apprenticeship in the study of physical science. Yet it is supposed that the lay mind, because it is attracted by the wonderful results of wireless telegraphy, is capable of appreciating the intricate physical theories with which the subject is bound up. It is as though a man should be expected to be able to weigh the merits of the electrolytic dissociation theory because he admires the electroplate upon his dinner-table. We doubt whether any useful end is served by such "popular" expositions, which can only lead to the spread of pseudo-scientific ideas based on ill-digested theories. It must be admitted, however, that on the whole Mr. de Tunzelmann has treated the subject broadly and clearly, and his explanations should at any rate be of considerable service to the student.

M. S.