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"BY PURENESS, BY KNOWLEDGE—BY LOVE UNFEIGNED."—ST. PAUL.

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[FOR THE CHRISTIAN VISITOR.]

"We are saved by Hope."—Romans viii. 24.
1 Peter i. 13.

Hope is unknown to saints in Heaven;
 Hope for Man's solace here is given;
 Hope is a gift of love divine.
 Hope does on promised help recline.
 Hope yields relief, though faith e'en fail.
 Hope will o'er doubts and fears prevail.
 Hope breaks the fetters of despair.
 Hope aids the mind's worst ills to bear.
 Hope mental darkness turns to light.
 Hope prompts against all foes to fight.
 Hope soothes the Captive when in chains.
 Hope mitigates severest pains.
 Hope nerves with strength the feeblest hand.
 Hope does, with joy, the heart expand.
 Hope urges on the tardy feet.
 Hope fills the soul with rapture sweet.
 Hope cheers amidst each care and toil.
 Hope e'en a ranc'rous foe will foil.
 Hope is the anchor of the soul.
 Hope raises from the deepest fall.
 Hope leans on Christ the soul to save.
 Hope leads the conquest o'er the grave.
 Hope can the fear of death remove.
 Hope looks for bliss in realms above.
 Hope points to rest when death is past.
 Hope wins the crown of life at last.
 Hope yields that peace nought else can give.
 HOPE, then, I'll cherish while I live!

R. T.

RAILWAYS IN SWITZERLAND.

[Translated from the Revue des deux Mondes, for the Boston Courier.]

Two years and a half ago, in December, 1849,—the federal assembly in Switzerland, at Berne, ordered an inquiry into "the practicability of establishing a net-work of railways in the cantons, and the best direction to be given to the principal lines, taking into view the wants of communication, industry and defence of the country." Even before 1849, interesting inquiries had been made on this subject by Swiss engineers. In 1838, M. Fraise, engineer in the canton of Vaud, published an excellent memorial in which he proposed and planned a railway between Lake Geneva and Lake Yverdon. After the resolution in December, 1839, the Swiss government appointed the celebrated English engineers, Robert Stephenson and Mr. Swinburne, to take charge of the investigation ordered by the federal assembly. It could not have chosen better; the report they made in October, 1850, shows how carefully they have studied the question, and how entirely they have entered into the spirit which should preside over the works of public utility in a nation whose revenue and credit are, as it were, still to be created.

It might have been feared that the man who conceived and executed the wonderful bridge, the *Britannia*, might be carried away by the idea, certainly very poetical, of leaping the Alps with a locomotive, or cutting through its crest by subterranean roads, opening on one side upon the plains of Lombardy, and on the other upon the valley of Jura. Such dreams have been too complacently indulged by engineers of undoubted merit, and the strange project of establishing a railway upon the Grimsel, one of the boldest and most elevated Alpine summits, was seriously thought of in other places than in Switzerland. Even the very last year, German and Italian governments sent skilful agents to examine, upon the spots, the difficulties of this extravagant operation, compared to which the famous tunnel of Mount Cenis, 12,000 metres* in length, was only child's play. Mr. Stephenson is happily en-

dowed, as engineer, with an essentially practical spirit. The predominant idea which directed his investigation was to secure to the Swiss, with the least possible expense, all the advantages of a system of railways. Nature has lavished upon Switzerland precious resources, as if to compensate it for the difficulties which a mountainous soil opposes, upon a vast portion of its territories, to the transportation of travellers and merchandise; to take advantage of these natural resources, Mr. Stephenson has especially devoted himself. By making use of the streams of water and the lakes, he reduced for example, to 46½ kilometres* the communication by railway between Soleure and Geneva. The whole distance between the two towns is 137 kilometres; the 90 other kilometres would be left to steamboat navigation, established upon Lake Lemane, between Geneva and Morges, from Yverdon to Neufhalet, and from the latter point to Soleure.

If this project is regarded not merely in the light of private interest to Switzerland, but as connecting itself with the general system of railways in the neighboring countries, it will be observed that the net-work of Messrs. Stephenson & Swinburne offers to Genoa (and also to Marseilles, if France ever resumes the project of connecting Lyons with Switzerland) the advantage of an uninterrupted communication with Basle, where the railways of the Rhine terminate, and with the shores of Lake Constance, where those of Wurtemberg and Bavaria terminate. The cross line from Basle to Lucerne, and thence by steamboat to Fluelen, conducts the communication to the foot of St. Gothard. The line from Coire to Rorschach, with a branch to Zurich by Wallens-tadt, offers the same advantages to Luckmanier and Splugen. France, Piedmont, Lombardy will no longer look upon Switzerland as a country without outlet, a barrier which must be avoided at any cost, because it breaks up and intercepts commercial relations. There is, however, one difficulty in the plan of the English engineers; it is that the projected net-work of railways will stop on both sides at the foot of the mountains; the passage of the Alps must then be made by ordinary carriages. It is certainly to be regretted that no other means could be found of surmounting this double barrier; but even if the locomotive could ever rush safely over the declivities, which it must now avoid as too rapid, it must be acknowledged that it will meet in the climate of the Alps, during five or six winter months, obstacles more formidable even than its lofty mountains. No one can be ignorant that one of the greatest and most frequent dangers of the Alps, during the winter season, is the sudden accumulation of snow, which the tempests heap up on spots, which appeared free a few moments before.—

The electric telegraph could be but an imperfect security upon a railway built across these mountains. A covered railway has been talked of; in theory this is possible, but what an expenditure it would involve, if this covering is made proof against avalanches of snow, ice and rocks! The Grimsel itself could be conquered by means of millions; there are no obstacles which money cannot surmount; but in commercial or industrial enterprises, the vital condition is that the expense should be in proportion to the revenue. Mr. Stephenson advises the Swiss not to avoid too much steep declivities where they will diminish labour, but to adopt for them the most simple style, and be satisfied with one track, for, by means of electric telegraphs upon lines where the communication will always be easily regulated, it is useless to have the expense of a double track.

Several routes have been proposed for the line from Bale to Alten, the only one we have said which presents any serious difficulties.—These difficulties, insurmountable by ordinary means, disappear in the plan of Mr. Stephenson by the application of mechanism, which relies upon the use of water. In this way, Mr. Stephenson thinks, great economy can be combined with safety. He proposes that the line from Bale to Alten shall cross the Hauenstein, one of the highest summits of the Jura, and says that this passage will present a favourable opportunity for taking advantage of the powerful water courses which are ready at hand.

Prejudice will undoubtedly raise many objections against this opinion; objections based principally upon a vague fear of the unknown; it will be said that the method is novel, dangerous, liable to delays, and that it has never been tried. These objections have no foundation. If it is true that water courses have not generally been very generally employed for such a service, there are, nevertheless, some instances of this employment. As to the supposed danger, proofs are not wanting to show that the use of inclined planes and cables has not been followed by any greater proportion of accidents than any other system. It is certain that in all cases where water has been properly employed, this mode of transport is far before every other in point of economy.—Mr. Stephenson's plan for adopting the use of an inclined plane is similar to that which Mr. Moncure Robinson has adopted in the United States upon the inclined planes of railways from Pottsville to Sunbury in Pennsylvania.

It is not only by the judicious employment of inclined planes, but is also by the happy union of steamboat navigation and railway that Mr. Stephenson's plan shows a mind widely occupied with economy and simplicity in the modes of execution. From Geneva to Morges, from Yverdon to Soleure, from Zurich to Wallens-tadt, the steamboat takes the place of the locomotive. The travelling will not be quite so rapid; from Geneva to Morges, a distance of 37 kilometres, the steamboat will take eighteen or twenty minutes more than a locomotive on a railway, a difference of some importance, in a communication as active as that which exists between Liverpool and Manchester, but unimportant as regards Switzerland. When one considers the immense value of the luxurious estates which adorn the borders of Lake Lemane from Geneva to Morges, and compares it to the limited financial resources of Switzerland, he cannot but applaud a project which spares the state ruinous appropriations of territory, even if it pays for them at their just value, or prevents it from committing robbery, if it cannot indemnify the owners.

The most serious objection which the plan of Mr. Stephenson has raised, is the delay and expense occasioned by the changes in the routes. To remedy it, this engineer proposes the employment of long steamboats constructed so as to receive fifteen or twenty wagons, which, at the landing, pass directly upon the railway with their load and *vice versa* as is done with the greatest ease upon one of the most travelled roads in Scotland—those from Edinburgh to Perth. This road thus crosses an arm of the sea, more than seven miles broad, open to the great tides and enormous waves of the Northern Sea. The medium swiftness of the boat is ten miles an hour; the lading and unloading does not take more than ten or twelve minutes. This mode has succeeded beyond the hopes of the engineer, and, notwithstanding the situation of this passage exposed to the sea, notwithstanding the strong easterly wind, which blows there in the spring, transit has been interrupted but one day in the course of a year.

The whole net-work of railways ready for travel constructed with one track over an extent of about 650 kilometres, will cost but 102,000,000, according to the estimate of the department of public works of the Swiss confederation. Even if the expense should amount to 130,000,000, as some persons think, who are judges in these matters, the sum would still be trifling compared to the advantages it would be to Switzerland. One example among a thousand will be sufficient to show what Switzerland will gain by the new mode of communication. We borrow from a report presented by M. Coindet of Geneva, to the department of public works of the Swiss confederation:—The canton of Vaud produces wines which the consumers of German Switzerland prefer to those of Alsace, not only for the taste, but because they keep better. With the present price of transportation in Switzerland, the Vaudois wine costs, to be delivered at Zurich, 32½ francs per *char*, (a wine measure,) more than the wine of Alsace, and usually the first value of the *char* is but little more than 100 francs. The annual exportation of the Vaudois wines is generally about 23,000 *chars*, which are worth about 2,500,000 francs, and the expense of transportation is little more than 1,100,000 francs. There is no country where the expense of transportation is as exorbitant as it is in Switzerland, not even in England. Now the same quantity of wine transported the same distance by railway, would cost less than 400,000 francs, and beside this economy of 700,000 francs on a value of 2,500,000, (almost a third,) there would be the advantage of great promptness in transportation and the better preservation of the wine, which would be exposed neither to the frauds nor changes in temperature incident to a long route.

We choose this example at random among the minor interests of Switzerland. The production of wine in the canton of Vaud is but of secondary importance; but if, to only one of the twenty-two confederate states, and in a single branch of its commerce, the economy realized by railways is equal to a sixth of the interest of the capital absorbed by the net-work, it is easy to conceive that the indirect profits resulting to the whole nation by the establishment of the system, will much exceed the direct revenue from the enterprise itself.

The establishment of railways in Switzerland will produce a great change in its agricultural interests, as it will open to them a much wider market, not only in Switzerland itself, but many of the principal cantons will find in France new channels for its produce. M. Coindet's report proves that these cantons have a right to reciprocity which Switzerland has not yet obtained. In point of consumption, Switzerland is in respect to France, the third state in the commercial world. It receives from thirty-five to thirty-six millions of French productions, and sells to France but sixteen or seventeen millions of its own.—France furnishes Switzerland nearly double what it receives. Still further; in the importations from France, the fabricated merchandise is in the proportion of eighty-six per cent. of the sum total; in the exportations of Switzerland this merchandise is only in the proportion of forty per cent. This difference, so unfavorable to Switzerland, is aggravated by the effect of the French duties.

The establishment of a system of railways in Switzerland will cause a perceptible change in the commercial relations of the confederation with the neighboring states, especially with France. The present position of the Swiss Republic authorises more than one would suppose, a change in its commercial policy. Under the old treaty the sovereignty of cantons was the presiding principle; this principle secured not only the political neu-

* A metre is equal to about 37 1-2 English inches.

* A fifth part of a marine league.