Swiss industries

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At Thun and Chur other matches were shot, with similar results. It should be added that the visitors were handicapped by inferior ammunition.

They saved their better rounds for the match at Zurich on Tuesday, where they met the "Stadtschützen" and the Swiss students. It was a rainy day and the sight was bad, but they improved their Berne score by 43 points beating the Swiss students by 1,695 points to 1,630, but succumbing to the Stadtschützen, who obtained 1,755 points. Their best single result was obtained by Fielding with 258 points.

At a final banquet the visiting team were presented with a silver cup by the Zurich Stadtschützen and a pewter plate by the Zürcher Stadtschützen, who are looking forward to repaying the visit.

Swiss Railways.

Two interesting bits of news from Switzerland are the following. *Burton Daily Mail*, 17th April:

Europe's most marvellous railway shunting yard is now in operation by the Swiss Federal Railways at Basle, where between 1,800 and 2,200 goods waggons alone now have to be uncoupled daily. At the present moment, with a heavy extra traffic, nearer 3,000 waggons a day are being handled. The new yard is situated outside Basle. Buildings and sheds cover an area of three square miles, with 35 miles of lines. Here are uncoupled and re-coupled into new trains for destinations in Switzerland or elsewhere on the Continent, all goods trains coming from Germany, France, Central Europe, and Northern Europe.

And "*Engineering*," 18th April:

We are informed that the Ateliers de Construction Oerlikon have recently obtained a contract from the Swiss Federal Railways for the construction of a 7,200-h.p. electric locomotive. This locomotive, which, it is stated, will be the largest in Europe, will consist of two close-coupled units, each of which will be equipped with four driving axles and three trailing axles. The driving axles will be arranged in pairs with a trailing axle between, as well as in front and behind them, making a total of eight driving axles, all of which will be equipped with two motors, and six trailing axles. The two outer and the two inner trailing axles on each unit will be coupled with the adjoining driving axle to form a bogie. The driving axles will have a side play of 2 by 20 mm., and the two middle trailing axles on each unit a similar play of 2 by 30 mm., to ensure easy running on curves. The diameters of the driving and trailing wheels will be 1,350 mm. and 950 mm. respectively, and the total wheel base will be 27.2 m., the length over the buffers being 32.5 m. The maximum tractive effort when starting, measured at the wheel rims, will be 141,100 lb., and the maximum speed 62 m.p.h. The adhesion will be 153 tons and the weight in working order 230 tons, of which the electrical equipment will account for 121 tons. Electricity will be supplied on the single phase system at 15,000 volts, and a frequency of 16 2/3 through four current collectors. Power will be transmitted from the motors to the driving axles through double reduction gearing with a transmission ratio of 1 : 3.5. This gearing, as well as the mechanical portion of the locomotive, is being manufactured by the Winterthur Locomotive Company. As the locomotive will be used on the St. Gotthard Railway, it will be equipped with regenerative braking.

Australians' Day of Fun.

Now that we shall soon read all about the Test Matches and think of the players getting very tired in the blazing and hot sunshine, we may be right to think that they will oft remember their snowball battle on the Rigi some little while ago. Says the *Daily News*, 21st April:

Revelling in six feet of snow, at a height of 6,000 feet on the highest peak of the Rigi, the Australian cricketers to-day spent their jolliest day since landing in Europe.

A quaint cogwheel train struggled up the terrific Alpine slopes for the first time this year with the team on board. Some of the players, notably Wall and Hurwood, saw snow for the first time.

On the top the team divided into sides for a rapid-fire snowball battle. They united again to reply to a flanking attack from the Pressmen.

Richardson afterwards offered himself as a sacrifice to his team mates. He stood on a stone pedestal on the brink of a 6,000ft. drop into the lake, and allowed all and sundry to take aim at him. He dodged their fire most successfully, swaying lithely at each shot.

The team sang happily on the journey home, and their favourite song was the old sweet "Lily of Laguna."

To-morrow they catch the 7 a.m. train to Paris on the last lap but one of their journey to London. In Paris to-morrow evening they will attend the Folies Bergere.—Reuter.

Hydro-electrical Development in Switzerland.

In the Aar Valley Europe's most ambitious hydro-electric power scheme is at present being constructed. In the neighbourhood of Grimsel, the Oberhasli Company, which has a capital of 36 million Swiss francs, contributed by the State and by the municipalities of Basle and Berne, is carrying out work which was started in 1925 and will be completed in 1931. The Grimsel power station will utilise both the main stream and the tributaries of the Aar River, accumulating the waters near the Grimsel Pass. The central turbine station is already half completed. It will produce a net power of 120,000 h.p. from a water fall 1,700 ft. in height.

Economic and electrical power experts in Switzerland expect an enormous improvement in the power supply of the country by the new works. Switzerland is rich in water-power, and consequently enjoys cheap electrical energy. Profits, however, are not very great, and only increases if the amount of electricity consumed will result in larger dividends. Thus bigger profits can only be achieved in one of three ways: first, by the complete electrification of railways in Switzerland, which country, incidentally, is ahead of any other country in this respect; secondly, by the use of electricity for heat (this depends on the price of coal, all coal in Switzerland being imported); and in the third place, by increasing the amount of electricity exported. Switzerland does export a certain amount already, and for all exports licences from the Federal Council are required.

It is interesting to note that those stations which export electrical power must be controlled by companies whose shares majority is held by Swiss nationals. Up to the present the great difficulty in further developing hydro-electrical power in Switzerland has been the transformation of the rivers into glaciers in winter, which meant a reduction in the output of electrical energy just at the time when the demand for heating and lighting was most urgent. For the last 20 years the keenest brains in the country have been working on the problem of hydro-electric supply in the winter. It was obvious that the only solution would be a huge reservoir in which water could accumulate during the summer and which would be big enough to supply the largest battery of turbines in Europe with a constant stream of water during the winter. But it was a question of how to achieve this.

Finally the Grimsel scheme now undertaken by the Oberhasli Company was evolved. The Company, by the way, undoubtedly succeeded in creating a wonderful reservoir. Very roughly outlined the idea is to make a bed for an enormous artificial lake between two mountain chains. It is work of a kind which has hardly ever been attempted before. From the centre works above mentioned the energy will be transported partly by an underground and partly by overhead cable to Innertkirchen, where the pressure of 50,000 volts will be raised to 150,000 volts. From there the electricity will be fed into the general network of Switzerland.

The accumulation of water in the Grimsel Pass will be achieved by an artificial dam lake which will have a capacity of one hundred million cubic metres. The lake will have an area of 2½ sq. kilometres and will be 5½ kilometres long. It will be formed by means of two dams, one of which will be curved and will have a height of 380 ft. It will be 200 ft. thick at the base and will consist of 400,000 cubic yards of masonry. The second wall will be 300 yards long and 45 yards high; 550 men are employed on building the walls alone. A special overhead cable railway has been constructed to carry cement to the factory, where 300 tons of concrete are produced daily; 300 cable trucks reach the factory every minute and discharge into 2 silos, each of a capacity of 2,000 tons. The chief engineer in charge of the works on the lake, M. Stampfli, told our correspondent that 4,000 cubic yards of concrete were recently built in one day. This constitutes, it is believed, a record never before achieved in any country. As work cannot be continued in the winter months, operations are carried on from May to November in three continuous shifts, day and night. The greatest use is being made of the natural local resources for such materials as rubble and sand. The works erected produce more than is required for present consumption, and the surplus is being accumulated to serve as a supply when the present source is covered by the rising waters of the lake. The latter is as yet only 60 ft. deep, but it will shortly reach a depth of 370 ft.

From this lake the water will be conducted by an underground tunnel, three miles long and nearly 8 ft. in diameter, to the Gelmer Lake. The regulation of the dam and the flow of water are to be effected from a chamber 400 ft. underground, which is connected with the surface by a lift. From the Gelmer Lake, the water is led through an iron and concrete pipe line to the turbines at Handeck. This line, which is 1,000 yards long and has a diameter of 2½ yards, slopes at an angle of 70 deg. The power house at Handeck is a granite building, the main hall of which is 54 ft. high and has a roof of copper plate on a wooden framework. It will house four turbines of 30,000 h.p. each, and also transformers to raise the voltage to 50,000 volts.

The turbines are at a height of 4,000 ft. above sea level, and in order to reduce the number of necessary operators at that altitude to a minimum, a system of "remote control" has been installed by Messrs. Siemens & Halske to be operated by means of servo-motors from Innertkirchen, from where voltmeters and ammeters are also to be operated by means of telegraph control from the main meters at the power station at Handeck.

The generators were built by the Oerlikon Company, and the turbines by Escher Wyss & Co.

The hot air from the transformers and generators is to be used for heating purposes in winter.

The transformers were built by the Brown-Boveri Co., and are cooled by oil circulation.

The current is conveyed from the power station to the transformer for the first three miles by an underground cable, owing to the danger of avalanches in winter. At an intermediate station at Cntamen it is transferred to aerial lines. A most notable feature of the scheme, explained Mr. Hank, the chief electrical engineer, is the complete absence of any switching gear until the current has passed the transformer station and is ready to enter the main supply network of Switzerland.

Extracts from "The Electrical Review."

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SWISS INDUSTRIES.

The building firm of Locher & Co., at Zurich, has recently celebrated the anniversary of its foundation. The founder, L. Locher-Oeri, was a descendant of an old Zurich family. His two sons and two grand-sons have been at the head of the firm in their turn and the house is famous for the construction of the Polytechnical School and the Cathedral Bridge at Zurich, the Pilatus railway, the Simplon tunnel and of a great number of railway stations, factories and bridges.

* * *

Brown-Boveri & Co. are the largest turbine builders in Europe, having constructed up to now about 13,000,000 kilowatts of turbine plant. Having no home market, the company carries on an extensive export trade. Before the war its chief market was Russia; after the war the company acquired a virtual monopoly in Belgium, where it was responsible for the erection of the Langenbrugge Power Station. It shares the Dutch market with the A.E.G. and through its French concern, the Compagnie Electro-Mécanique, it has a big influence on the French market. The company's name leapt into particular prominence when, in the face of severe American competition, it obtained the order for the 160,000 unit for the Hell Gate Power Station in New York—by far the biggest turbine in the world at the time. M.G.

* * *

The Board of Directors of the Aluminium A.G. Neuhausen have decided to close their factory at Laufenberg and to transfer its activities to Chippis.

WHY EUROPE IS MONOGAMOUS.

An amusing incident is related by J. D. Dittmar in the periodical "New China." A woman missionary visited the house of a Mandarin and was received by the eight wives of the host. Those wives had never before seen a European woman and were greatly intrigued by the missionary's hair and white skin. The greatest astonishment, however, was the fact that her feet were not crippled. The following dialogue took place:—

"Can you run like a man?"

"Certainly."

(Astonished silence.)

"Can you swim?"

"Oh yes."

"Can you ride on horseback?"

"Yes."

(Still more astonished silence.) Then:—

"If your husband beats you, are you allowed to hit back?"

"Undoubtedly."

The Chinese ladies looked at each other meaningly, and one said: "Now we know at last, why European men marry only one wife. They are afraid!" (*National-Zeitung.*)