Notes and Gleanings

NOTES AND GLEANINGS.

By "KIBURG."

If I have indulged in "day-dreaming," as the Editor's note of last week would suggest, I feel that I have been in good company, and very many of my compatriots must be doing the same, i.e., seeking refuge from the heat by giving the sun-kissed City of London a temporary miss and by going, instead, to fill their lungs with the energy-reviving sea-air. Just to satisfy the curiosity of my readers a wee bit, I will let them into a secret, namely, that Cornwall is really a wonderful place to go to for a short, or preferably a long, holiday, especially if one is very careful in the selection of one's company.

Now to the business of the week!

Pope and Switzerland.

Universe and Catholic Weekly (4th July):—

A splendid reception was given on Whitsunday by the Catholic population of the city of St. Gall to H.E. Mgr. Luigi Maglione, Titular Archbishop of Cæsarea, Apostolic Nuncio to the Swiss Government, invited to St. Gall by the Bishop of the Diocese, Mgr. Robertus Buerkler. His Excellency celebrated High Mass in the beautiful old cathedral of the city, named after St. Gall, the Irish monk who Christianised that district some fifteen centuries ago.

Previous to the service, Mgr. Maglione paid a complimentary visit to the local Government, who received him corporately at the Town Hall. The acting President, M. Weber, a Protestant, in a very sympathetic speech, welcomed the Nuncio, recalling his predecessor's visit as far back as 1847, and acknowledging all the good the Holy See has done, during and since the war, in the interest of peace and for the benefit of those who suffered from the war and its many consequences. In reply, His Excellency said that he had always considered his mission as one to be fulfilled in a spirit of true and complete harmony amongst the various religious denominations. "I pray Catholics," he continued, "to look upon their non-Catholic fellow-citizens as their brethren, and to look after their own Catholic rights and liberties within the limits of law and order."

In the evening there was a magnificent gathering in the spacious Tonhalle, about 7,000 people attending. Representative Catholics from both the clergy and laity welcomed the Papal representative, addressing him in Latin, Italian, and German. Replying, Mgr. Maglione, deeply moved, at first extended his hearty thanks to all concerned, and then said how pleased he was to see that in Switzerland, central and local government alike are animated by the deep love of justice and a strong desire to deal fairly and respectfully with all denominations. Justice towards all is also sufficient to the Catholic Swiss, as their only wish is liberty and equal treatment. "A good Catholic," continued the Nuncio, "must also be a good citizen. That does not hinder his attachment to the Holy See, as the latter loves the nations all and endeavours to fortify, beyond national boundaries, the brotherly love of all for each other, and so to restore peace amongst the Christian nations.

"I am very pleased to witness the loyalty of the Catholic Swiss to the Holy Father, who, in turn, loves the Swiss very much indeed, and will never forget the happy time he spent in this country—in the Swiss Alps, at Fribourg, with its international Catholic University, and at St. Gall, with the precious library of its former glorious Abbey."

Human nature will probably not allow of the various denominations of Christian Churches uniting, unless some outside pressure, some danger too horrible, perhaps, to contemplate now, forces them to do so in sheer self-defence. Meanwhile it is a pleasure to see that sometimes differences can be temporarily forgotten and replaced by the brotherly Love, which is the foremost privilege of true followers of Jesus Christ.

Across the Alps.

Morning Post (7th July):—

With the disappearance of the last snow from the Grand St. Bernard, all the Swiss Alpine passes are now open to motor traffic. Until a few years ago motoring in the Swiss Alps was tolerated only on a restricted number of routes, but now practically every pass of importance can be used in safety and comfort. The original hostility of the peasants was due in great measure to the fact that, as originally constructed, many of the passes were unsafe for heavy vehicles. Where these are now allowed, however, the roads have either been widened or strengthened on the outside. In addition, the law providing that the official postal cars shall take the mountain side of the road when meeting other vehicles eliminates the chief danger to motor traffic in the mountains.

The Swiss Post Office has now twenty alpine motor coach services in operation, and up to the present no accident of a serious nature has occurred. In the course of their journeys half of these cars have to make daily trips over passes of six thousand feet, and last year the number of passengers carried was 132,622, as against 65,000 in the days of the old diligences. The cars possess a special automatic brake of great power, and the maximum speed allowed is twelve miles an hour when climbing, and thirteen during the descent. Specially trained chauffeurs are employed.

Chief amongst the excursions to be made by Swiss postal coaches are: Orsières to Grand St. Bernard, 8,110 ft.; the Simplon, 6,594 ft.; from Brigue to Iselle on the Italian frontier; the Furka, 7,976 ft.; from Andermatt to Gletsch; from Andermatt to Airolo, via the St. Gothard, 6,926 ft.; Altorf to Linthal, over the Klausen, 6,404 ft.; and the Julier, 7,503 ft., from Chur to St. Moritz in the Engadine.

The above article, or perhaps also previous experience, have evidently inspired the following, taken from *Light Car and Cyclecar* (4th July):—

Owner of Singer car, leaving on July 18th on an 18-day tour through Swiss Alps, would be pleased to hear of another light-car owner contemplating this tour on date given with a view to joining company.—J. C. Nussle, 4, New London Street, E.C.3.

I hope Mr. Nussle will find a companion and have a glorious time, unmarred by punctures and carburettor troubles, etc.

Swiss Railway Electrification.

"Kyburg," as the name says, watches the prosperity of his native town with great sympathy and interest, and paragraphs like the following always fill his heart with legitimate pride (*Engineer*, 4th July):—

In connection with the articles on the Swiss Federal Railways, published in our issue of June 6th, 13th and 20th, we are requested to state that all the electric locomotives now being built for the Federal Railways, as far as the mechanical portions are concerned, were entirely designed by the Swiss Locomotive Machine Works at Winterthur, and that the mechanical parts of all of them were built by this firm. We may add that as a result of the successful operation of these locomotives the Swiss Federal Railways have entrusted this firm with the orders for all the mechanical parts of their electric locomotives.

Have you ever noticed, when returning home to Switzerland, that the name of "Winterthur" appears on all locomotives which await you at the frontier to take you home?

Switzerland's Water Power.

The following abstract of a paper read at the World Power Conference (*Engineering*, 4th July) will interest our readers:—

As is well known, Switzerland is greatly favoured from the point of view of water power, and already has developed these resources to such an extent that in 1922 the possible production was placed at 4,870,000,000 kw.-hours. The actual production was 2,880,000,000 kw.-hours, or 59 per cent. of the total possible. The report on Switzerland was a composite production by Messrs. Buchi, Eggenberger, Harry, Strickler and Zangger, each of whom have appended their names to sections. The water-power still available can be reckoned at 8,000,000 of installed horse-power. In 1922, 53 per cent. of the energy was used for lighting, motive power and heating, 23 per cent. for electro-chemical and metallurgical processes, 16 per cent. was exported to foreign countries, and 8 per cent. was used for railways. It is estimated that 95 per cent. of all localities was connected to electric distribution systems, and 90 per cent. of the houses were fitted with electric light; 95 per cent. to 98 per cent. of the motors were electrical machines, and from 40 per cent. to 45 per cent of the railways were electrified. The price per unit was relatively high on account of the cost of transmission. The rivers had a small flow in winter and large in summer, and water was stored in lakes, etc., for equalisation. The rivers are mostly public property; concessions are usually granted by the Cantons, subject to compliance with Federal laws.

And I think the following article, while containing many things known to most of my readers, will yet interest them greatly, on account of its concise exposition of facts which are especially important to Switzerland and the Swiss.

Wor'd Power—What it means to Mankind.

Daily News (5th July):—

The World Power Conference at Wembley is of more than passing interest to the average citizen. His own well-being, the prosperity of the community—in fact, the very existence of civilisation—depends upon the application of power to transport by sea, by land, by air. Continents are linked together by power-driven ships. All civilised countries are intersected by power-driven railways. No town of any size is without its power station for lighting and transport. Water supply, sanitation and all public services depend upon power.

A listener-in to the discussions at Wembley would frequently hear the expression "horse-power-hour," "kilowatt-hour." The strange-sounding combination of words "horse-power-hour" has a simple meaning. It stands for the amount of work a horse will do in an hour. The unit of work is a foot pound. A foot pound of work is done when a weight of one pound is lifted one foot high. A man walking up a hill 300 feet high lifts his body, weighing, say, 150 pounds 300 feet high, doing thereby 45,000 foot pounds of work in addition to the muscular work of walking the distance up the hill on the level. Whether he walks up or runs up the hill, the work done is the same, but the time taken to do it is different.

The power of the man is measured by reducing his performance to the work he can do per second. His heart and his lungs impose a limit to the work his muscles can do per second. A healthy man in good condition could probably work continuously at the rate of 70 foot pounds per second. At this rate it would take him nearly 650 seconds to walk up the hill.

A horse is conventionally assumed to be able to do 550 foot pounds per second. This is an inconveniently small number, so that engineers take as their unit of energy for buying and selling purposes the work a horse is able to do in one hour, namely, 1,980,000 foot pounds. The term "horse-power-hour" is thus synonymous with the definite quantity, "1,980,000 foot pounds." Energy sold at a penny per horse-power-hour means that you can purchase 1,980,000 foot pounds for a penny.

The term "kilowatt-hour" is the buying and selling unit of the metric system. It is equal to 265,500 foot pounds. It is better known by its other name, the "Board of Trade unit." We pay our electric light bills in terms of this unit. Energy at sixpence a Board of Trade unit, a not unusual price for electric energy for lighting purposes, means that for sixpence we purchase 265,500 foot pounds. This energy, when used for electric lighting, is dissipated in heat by forcing it through a filament to make it incandescent.

There is no reason, except the cost, why electric energy should not be used for saving muscular energy, as, for instance, driving carpet sweepers, driving sewing machines, operating vacuum cleaners, and many other things. Cheap energy in the home would solve many domestic problems.

It will thus be understood that the term "power" means technically the rate of doing work—that is, the work done per unit of time.

The chief natural sources of energy are waterfalls and fuel. To make either furnish available energy a prime mover is necessary. The turbine is the prime mover at a waterfall. The steam plant, including boiler, engine and condenser, is the prime mover for the utilisation of coal. The internal combustion engine is the prime mover for gaseous fuel or for oil fuel. When energy is distributed from a centre, the prime mover is the first link in a chain connecting it with machines at a distance. Or looked at the othe way, the machine operating a carpet sweeper is connected through leads and cables to the prime mover at the central station. The motor driving the axle of an electric locomotive is connected to the prime mover through cables and transformer stations.

The method of transmission between the prime mover and the machine at a distance may be by compressed air, by water under pressure, by ropes and cables when the distance is small, but all these methods fall into the background when long-distance transmission is necessary. Then electric transmission is the only practicable method when the prime mover is located at the source of natural energy.

When the prime movers are not located at the source of natural energy, as for example locomotives, and stationary steam engines of all kinds distributed through the country, the means of transmission is a coal truck. The coal truck carries the fuel from the mine to the prime mover, and the prime mover transforms the energy latent in the coal into mechanical energy on the driving axles of the locomotives and the crank shafts of the stationary engines.

Would it not be more economical to concentrate the prime mover at the coal mine and transmit the energy it produces from the coal electrically to the train, or to the factory?

We may watch a waterfall and deplore the waste of energy as we see tons of water per second falling and wasting its energy of height in whirlpools and rapids. But we must not forget that the cost of the works necessary to make the energy of this waterfall available may be prohibitive.

After building a power station and constructing the works necessary to bring the water to and away from it; after installing a turbine to convert the energy of the fall into mechanical energy to drive the turbine shaft; after converting the energy into electrical energy by means of a dynamo and transmitting it over a line with its poles, insulated cables and sub-stations; after reconverting, say, a hundred miles away, into mechanical energy to drive a machine, and after allowing for capital charges, wear and depreciation and running costs, can we supply a horse-power-hour at a cheaper rate than a prime mover on the spot supplied with fuel, either oil or coal? The answers to these and kindred questions are under discussion at Wembley.

The answers depend upon local and geographical conditions. Switzerland has water power and no fuel power. Her answer is, a turbine prime mover at the fall, and electric transmission to the train. England has fuel power in abundance, but little reliable water power. Would it pay to utilise the water power of the Severn? After allowing for the enormous cost of the works, could a Severn power scheme sell a horse-power-hour as cheaply as a power scheme based upon the fuel power of the South Wales coal field? There are many questions concerning power for discussion and answer.

Tomb of St. Sigismund.

Catholic Herald (5th July):—

The tomb of the saint-king, Sigismund, the Burgund, who died 1,400 years ago, has been discovered at St. Maurice, in Switzerland, by Dr. Stuckelberg, of the University of Basle, and the discovery has caused a sensation in Switzerland. Dr. Stuckelberg found relics of the saint in the tomb, he has reported. Some time ago this same investigator discovered rare silk and linen embroidery of the sixth and seventh centuries at St. Maurice.

Sigismund ruled over the old German nation of the Burgunds, and undertook to destroy Arianism and brought his people to the Catholic Church. He himself built the monastery of St. Maurice about 515, and became king upon the death of his father, Gundobad, in 516. The synods of Epaone and Lyons were held under his presidentship, and he also founded schools to promote the study of Latin and Greek science and literature.

The German Emperor Karl IV opened St. Sigismund's grave in 1364, and many of the relics were taken to Prague, in Bohemia. About 1650 the tomb had been filled up, and in 1714 a parish church was built on the spot. Since the tomb had also been walled up, all endeavours in the last few centuries to find it were in vain.

DIE STEUERN IN DER SCHWEIZ.

Zu den verdienstlichsten Publikationen des Eidgenössischen Statistischen Bureaus zählen die jährlich erscheinenden Zusammenstellungen über die Erwerbs- und Vermögenssteuern in den grösseren Gemeinden der Schweiz. Diese Statistik vermittelt einen ausgezeichneten Einblick in die grossen Unterschiede, die bei der fiskalischen Belastung der einzelnen Einkommens- und Erwerbskategorien von Kanton zu Kanton bestehen. . . .

Die Belastung des Arbeits-Einkommens.

In den Erwerbssteuern zeigen sich von Stadt zu Stadt grosse Verschiedenheiten, die teilweise auf veraltete Steuersysteme zurückzuführen sind, teilweise aber mit der ökonomischen Lage der Bevölkerung zusammenhängen. Speziell in der Belastung der niedrigen und mittleren Einkommen herrschen die grössten Differenzen, während in der Besteuerung der hohen Einkommen eher Einheitlichkeit besteht. Ein Einkommen von 3000 Fr. ist in Basel steuerfrei, wenn man die Kirchensteuer (Fr. 7.50) nicht in Berücksichtigung zieht. In Zürich sind dagegen für 3000 Fr. bereits 82 Fr. zu entrichten, in Bern 144 Fr., während die höchste Belastung in Bellinzona mit 156 Fr. erreicht wird. Ein Einkommen von 10,000 Fr. bezahlt in Basel 460 Fr. Steuern, in Zürich 770 Fr., in Bern 798 Fr., in Herisau 1147 Fr. und in Chur 1626 Fr. Ein Arbeitseinkommen von 50,000 Fr. ist in Basel mit 6,492 Fr. belastet, in Bern mit 7,575 Fr., in Zürich mit 8,175.; exorbitante Sätze haben Chur und Davos mit über 15,000 Fr. Aus der eidgenössischen Steuerstatistik ergibt sich, dass in Basel die sozialpolitisch treffliche Tendenz verfolgt wird, die bescheidenen und mittleren Einkommen zu schonen und so die Vermögensbildung anzuregen, während in einigen anderen Städten der Steuerdruck bei diesen Bevölkerungsschichten relativ härter ist als auf den hohen Einkommen. Vergleiche über die