

some structure, affording a pleasant contrast to those in its immediate vicinity.

The objects and purposes which this institution should fulfil have been fully ventilated and discussed in these columns ever since the idea of such a national memorial, commemorative of the fiftieth year of the reign of Her Majesty, was suggested. This being so, it will be interesting to many of our readers if we make one or two comparisons of the scheme as it exists at present with the past suggestions. In an article on "Science and the Jubilee" in 1887 (*NATURE*, vol. xxxv. p. 217), we wrote:—

"... There is room for an Imperial Institute which might without difficulty be made one of the glories of the land, and which would do more for the federation of England and her colonies than almost any other machinery that it is possible to imagine. But it must be almost exclusively a scientific institution. Its watchwords should be 'Knowledge and Welcome.' England, through such an institution, should help her colonies in the arts of peace, as she does at present exclusively in the arts of war. In an Imperial Institute we can imagine the topography, the geology, the botany, and the various applications of science, and the industries of Greater Britain going hand in hand."

Again, referring to the proposed inclusion of an Emigration Office in the scheme, it was remarked:—

"With this we cordially agree. But the return current must be provided for. Those who have lived in England's colonies and dependencies know best the intense home feeling, and in many cases the stern necessity there is of close contact with the mother country. Let the Imperial Institute be England's official home of her returning children—the hall in which she officially welcomes them back. Let them here find all they need, and let information and welcome be afforded with no stinted hand."

An inspection of the parts already ready for occupation in the new building took place on Saturday last, and we confess frankly that the idea of "Welcome" referred to in the preceding paragraph has been fully carried out. The building is admirable architecturally, and in the various halls set apart for the purpose the children of the Greater Britain beyond the seas will find no unworthy home when they visit the mother country. Their intercourse will not be confined to meeting each other; the proposal to create home Fellows of the Institute will, no doubt, be taken advantage of by all interested in all the larger questions on which the progress of the Empire must depend. By this means an Imperial Club of a very real kind has been created.

So far, then, as one of the watchwords, "Welcome," is concerned, there is cause for sincere congratulation. It is too soon to discuss the many proposals regarding the other watchword, "Knowledge," with the future activity of the Institute in the second direction. The lines of activity already actually taken up and provided for in the building as now arranged may be gathered from a glance through the pages of the pamphlet and papers distributed on Saturday.

The contents of the galleries will constitute "a living representation of the resources of the Empire and of the condition of its industries and commerce." The permanent collections will illustrate "the natural and industrial products of the United Kingdom, of the several Colonies, and of India," while, from time to time, occasional exhibitions will be held which will, "it is hoped, stimulate and enlist the sympathies of Colonial, Indian, and British producers, and promote active co-operation with the industrial section of the Empire."

The collections will be arranged and described in such a manner as to afford full "scientific, practical, and commercial information relating to the sources, nature, facilities of supply, and applications of well-known natural products, and of those whose industrial or commercial

value still needs development." The libraries, offices of reference, reading-rooms, &c., in conjunction with the above exhibits, should form therefore a mine of wealth. We note also an arrangement by which samples of products will be given to anyone who may be desirous of obtaining specific information respecting any particular product included in the collection.

Ample opportunities are to be offered for conference on matters of common interest, and for the interchange of information relative to both Great and Greater Britain.

Such, then, are some of the points included in the preliminary arrangement of the building. No one, we suppose, considers them as final. Natural selection will come in, and it rests with the representatives of the scientific bodies among the governing body to determine which parts of "Knowledge" of the higher kind shall be fostered. This is a problem for the future. We need not stop to consider it now.

One word about the building itself and the allocation of space.

Passing through the principal entrance, which is constructed altogether of Portland stone, the large reception hall is reached, which, when finished, will constitute one of the finest we have, various marbles and Indian teak panelling being profusely used.

The principal floor contains in its western corridor the British-American and British-Australasian conference rooms, the council chamber, and the secretarial and clerical offices; and in the eastern corridor the British-Indian and British-African conference rooms, the writing, reading, and news rooms, and the temporary library. The principal stairway, leading to the second floor, will, when finished, be a handsome piece of work; the steps will be of Hopton Wood stone, with marble balusters and rails, while the walls will be lined with specimens of British and Colonial marbles, and the ceiling profusely decorated with arabesque plaster.

On the first floor the Fellows' dining and reading rooms are situated. The rooms in the east corridor, occupied at present by a very interesting exhibition of Indian art metal work, will subsequently be used for the commercial department and commercial conferences. In the west corridor various rooms will be put at the disposal of various Societies "whose objects are kindred to those of the Imperial Institute."

On the second floor will be situated the public dining and refreshment room. Here also the rooms in the west corridor and on the south side will be used as sample examination rooms: there will also be a map room and a Fellows' smoking room. The east corridor will, we are somewhat ambiguously informed, be occupied probably by "certain Societies who are seeking the splendid accommodation which the Institute affords for carrying on their work." When these Societies are named, the policy of the governing body in this direction will become more obvious.

TIME STANDARDS OF EUROPE.

THE era of world time is yet far off, and it is certain that the desirable scheme for a uniform horary standard put forward by the Astronomer-Royal (*NATURE*, vol. xxxiii. p. 521) will not be realized this century. But though this be so, signs of better times in the reckoning of the hours of the day have recently appeared, and the practical outcome of the Prime Meridian Conference at Washington (*NATURE*, vol. xxxiii. p. 259) is already of importance. Time is a problem to us all—a problem which has baffled the philosopher, driven the astronomer to devices which closely resemble subterfuges, and harassed the watchmaker beyond all other craftsmen. Much light on the difficult but all-important question is focussed in Mr. Lupton's article in *NATURE*, vol. xxxix. p. 374; but education will do more than it has yet done

when the average man succeeds in understanding what he cannot but believe, that forenoon events in Australia are printed in British newspaper offices before daylight on the day they occur, while morning doings in Hawaii cannot fly fast enough by cable to catch the latest edition of the evening papers. In strict justice the time of no two meridians should be the same; and as a matter of fact, in pre-railway days every town, and every garden large enough to boast a sun-dial, set itself by its own local time. Railways have made the uniformity of time within narrow belts of longitude a necessity, and so largely does the railway affect modern civilized life that railway time soon comes to regulate all affairs. The vexation of frequent changes of time standards is familiar to all who have travelled on the Continent, and for many practical purposes the change which has been quietly progressing for the last few years is a benefit of great value. This change was brought home to the dwellers in Belgium and the Netherlands on May 1, 1892, by the retardation of all the railway clocks by from ten to twenty minutes from local to Greenwich time, an alteration of the time-gauge of two countries far more significant than the conversion to standard gauge of the railways of England.

At the Poles, where all meridians converge, there can be no natural standard time, for it is every hour of the day at once; but the regulation of time at these singular points has not yet become a burning question. Were the system of time-reckoning recommended by the Prime Meridian Conference carried out in its entirety, the minutes indicated on all well-regulated clock-dials throughout the world would be the same at a given instant, but the hours would differ at each 15° of longitude by steps of one, twenty-four standards encircling the globe. Thus, for example, at 25 minutes past noon of the prime (or rather the zero) meridian, clocks 90° E. would show 25 minutes past 6 p.m. (18h. 25m.); those 90° W., 25 minutes past 6 a.m. (6h. 25m.); and those at 180° , 25 minutes past midnight. The zero meridian adopted by the Prime Meridian Conference is that of Greenwich; and definite time standards based on hourly intervals from this starting-line have been used since 1883 on the railways of North America. That continent is divided into strips 15° in width, in each of which a separate time standard prevails, from the Gulf of Mexico to Hudson Bay. Atlantic time in the eastern provinces of Canada, and in Newfoundland, shows 8 a.m. at Greenwich noon; Eastern time in the Atlantic States of the Union marks 7 a.m. at the same moment; while Central, Mountain, and Pacific time indicate respectively 6, 5, and 4 a.m. The meridians which set the clocks across America are those of 60° , 75° , 90° , 105° , and 120° W.

The conditions in Europe are more complicated than in America. Each small closely-peopled country, with its national Observatory, naturally tends to adopt throughout its particular national time, although even this is still a desideratum in some. In the difficult subdivisions of Imperial Germany especially, the number of independent and unrelated standards was a grievous obstacle to the interpretation of through railway time-tables.

The British Islands, lying at the extreme west of Europe, should logically keep time of the zero meridian, which intersects Greenwich Observatory; while the Russian Empire (in Europe at least) was by its system of central government and State control of railways equally committed to the time of St. Petersburg. But Pulkova Observatory lies two hours east of Greenwich plus one minute and a quarter, and the alteration required is so small that it may be said already to constitute East European time, two hours in advance of Greenwich, or the standard time of West Europe. The meridian of 15° E., running through Norway, Sweden, Germany, Austria, and Italy, corresponds to Central European time, one hour in advance of that of Greenwich, and if national

prejudices and local inertia were overcome, the time of Europe would be placed on a very simple footing by its adoption. The railways of Austria-Hungary have used Central European time on this system since October 1, 1891. More than fifty towns in the monarchy have since then regulated their clocks to correspond, Vienna being the only conspicuous exception, where local time is used for local purposes. Servian time-tables have been assimilated to those of Central Europe, and Bulgarian to Eastern Europe; while Turkey, pulled two ways, yields on both sides, following Central European time on the Salonika railway and Eastern European time on the Constantinople line.

In Sweden railway time has been that of Central Europe (15° E.) since 1879, and in South Germany the change to the same standard took place on April 1, 1892, a fact of much greater importance, because a feat very difficult to accomplish. The four standards of Bavaria, Württemberg, Baden, and Alsace-Lorraine were previously in use concurrently, and the change involved retarding the nominal hours of all trains from 14 minutes in the case of Bavaria to 34 minutes in that of the Reichsland. Luxemburg came into harmony with the rest of Central Europe at the same date, with the loss of 36 minutes.

By a decision of the Federal Council in May last, mean solar time of the 15th meridian will become standard time for the whole German Empire on April 1, 1893, when it exclusively will be employed for railway, telegraph, and all State purposes. Already several places in North Germany have adopted the new time, and it can only be a matter of a few years for the simpler uniform system to acquire a footing for all the purposes of private life.

The number of European time standards is stated by Dr. Busschere¹ to have been 24 on January 1, 1891, and by the end of 1892 it will only be 13. Of these, three are meridional standards, while ten are the times of capitals, viz: Paris, Madrid, Lisbon, Rome, Berne, Bucharest, Athens, Copenhagen, Berlin, and St. Petersburg, but the last, as already mentioned, practically belongs to the former category. It now remains only for France, Spain, and Portugal to adopt Western European time, for Denmark, Switzerland, and Italy to accept Central time, and for Greece and Rumania to join the other Balkan States in using Central or Eastern time, and the change will be complete.

Strangely enough, although foreign writers tacitly assume that the British Islands are at one in their time standard, there exists in the United Kingdom a diversity as illogical as that which formerly reigned in the States of Southern Germany. While Great Britain and the small island groups associated with it keep the time of the initial meridian, now extended to Belgium and Holland on the east, Ireland is regulated by Dublin time. Thus it happens that when the post-office clock in Stornoway ($6^\circ 15'$ W.) shows noon, that in Donaghadee ($5^\circ 30'$ W.) only marks 11h. 35m.

As long ago as 1888, Japan adopted for its standard time that of the ninth hour interval from Greenwich (135° E.), so that the clocks which regulate the movements of the Japanese are set nine hours in advance of ours.

India, Australia, and Cape Colony remain independent in their time relations, although so simple a readjustment as is required might form a graceful concession to the spirit of federation without sacrifice of local dignity or utility.

There is no authentic publication known to us which sets forth the time standards actually employed in the chief towns of the world, but fallacious information on the subject is to be found in many atlases and clock-face diagrams. Even so eminently practical a work as "Bradshaw's Railway Guide" contains month after month a map graduated on the margin to show the difference of time between Greenwich and the rest of

¹ Bulletin of the Royal Belgian Geographical Society, 1892, No. 2, p. 196. From this paper many of the statements given above have been derived.

England, leaving it to be implied that the local time thus shown is that actually employed, and Kelly's famous directories are disfigured with similar tables.

It is much to be regretted that the system of numbering the hours of the day from 0 to 24 has failed to hold the popular fancy. Despite the big clock-face on Greenwich Observatory, people still know their hours by the old ambiguous titles. Usually there is no room for misunderstanding, but mistakes are sometimes possible. A foreign potentate visiting this country recently was much *fêted* during his short stay, breakfasts, luncheons, and dinners being given in his honour, when a certain judge issued a card of invitation to a "Reception at 10 o'clock," which some of the guests interpreted as a.m., and others as p.m. Missing a foreign Prince through such ambiguity is a trifle compared with missing a train or miscalculating the length of a journey, and yet we know of no English time-table (we have heard of American) in which the simple plan of naming the afternoon hours from 12 to 23 is adopted. The method is occasionally used in the record of scientific observations, and always with advantage.

The present time-standards on the railways of Europe may be summarized as follows:—

(1) *Time of the initial meridian* (Western Europe) 0° (12.0):—Great Britain, Belgium, the Netherlands.

(2) *Time of the first hour interval* (Central Europe), 15° E. (13.0): Sweden, Luxemburg, Germany (Prussia excepted temporarily), Austria-Hungary, Servia, Bulgaria, Western Turkey.

(3) *Time of the second hour interval* (Eastern Europe), 30° E. (14.0): Eastern Turkey, Russia (practically).

Countries conforming to national standards or to no system, with the hour adopted in their capitals at Greenwich noon: Ireland (11.35), France (12.9), Spain (11.46), Portugal (11.23), Switzerland (12.30), Italy (12.50), Rumania (13.44), Greece (13.35).

HUGH ROBERT MILL.

NOTES.

MR. H. T. STANTON, F.R.S., the well-known entomologist, has been appointed one of the Curators of the Hope Professorship at Oxford, to fill the vacancy caused by the death of Prof. Moseley.

SIGNOR GIUSEPPE FIORELLI is retiring from the general direction of the antiquities of Italy, and his friends and admirers have resolved to mark the occasion by giving expression to their high appreciation of his work as an archæologist. A committee has been appointed by the Accademia dei Lincei to make the necessary preparations. It is proposed that a medal shall be struck in his honour, and that any sum which may remain after this has been done shall be set apart for the encouragement of archæological studies in accordance with Signor Fiorelli's suggestions.

THE second International Congress of Physiology is to be held at Liège on August 28 to 31.

ON Tuesday a conference was held at Lord Brassey's house for the consideration of the best means of establishing a laboratory of marine biology in Jamaica in commemoration of the fourth centenary of the discovery of America. Lord Rosse moved the first resolution, "That an observatory of marine biology in tropical seas is necessary for the development of science." Prof. Ray Lankester seconded the resolution, and in doing so said that nothing could do more to advance our knowledge of biology at the present moment than the work of such a laboratory as that which it was proposed to establish. They wanted a place where the naturalist could work, and above all they wanted an organization, with a permanent official in charge who would gradually accumulate knowledge of the animals and plants which were to be found in the surrounding waters. They wanted in such a laboratory the means of

dredging. He hoped they would have a steam vessel, and that the vessel would be large, and the actual building of the laboratory small. He trusted that there would be an adequate private subscription to enable them to build the laboratory, but the carrying on of the work would require an annual income, which he hoped the home Government and the island Government would be prepared to find. The resolution was carried unanimously. Mr. Villiers-Stuart moved, and Mr. Wellesley Bourke (M.L.C., Jamaica) seconded, "That no tropical sea promises so rich a harvest of biological specimens as the great gulf of the West Indies; that Jamaica is the most central and most suitable station for such an observatory, and that its establishment would be a suitable memorial of the fourth centenary of the discovery of the Western Hemisphere." This also was unanimously agreed to.

THE Crystal Palace on Saturday last was specially visited by Lord Kelvin to view the National Electrical Exhibition at present being held in its buildings. This Exhibition, as everyone who has seen it must be aware, is a thoroughly representative one, and besides illustrating the present condition of the application of electricity for practical purposes, carries one back especially in the Post Office exhibit, to the time of its infancy: the historical collection is of considerable importance, and has been well selected. Instruments are there shown, which have five needles on their dials, the presence of which was once necessary to carry on a conversation, the number of words spoken per minute amounting only to single figures. Very interesting old specimens of cables are also shown, together with the part of a telegraph post connected with the pathetic case of a poor woodpecker which, in the endeavour to find the insect that was producing (so he thought) the humming noise in the post, had pecked a large hole in it. In the demonstration room of Messrs. Siemens Brothers, some truly wonderful sights were displayed. The flame produced by exciting an induction-coil by means of an alternating current was produced on a very large scale, and as it issued from the secondary poles, was made to pass through pieces of wood, lumps of salt and slate, the most striking case being its passage through a large piece of plate glass, for which a very strong current was required. Among the many other exhibits, we may mention the demonstrations in cooking by electricity. The bottom of the kettle or saucepan is coated with a specially prepared enamel, into which a fine wire resistance is embedded; by this means, as the wire becomes heated, the temperature of the kettle, and therefore of the water in it, is raised. We may note that the Exhibition closes on Saturday, July 2, so that those who have not already visited it should do so without delay.

A REUTER'S telegram from Vizagapatam, Madras, announces the death of Mr. Narasinga Row, the well-known native astronomer. He died on Saturday last.

THE death of Hermann Burmeister, the well-known German zoologist, at Buenos Aires, is announced. He died on May 1 in his eighty-sixth year. In his early days he was a Professor of Zoology at Halle. During the revolutionary period of 1848 and the following years he associated himself prominently with the Liberals, the result being that in 1850 he had to quit Germany. He travelled for some time in Brazil, and then returned to his native country. He went back to South America in 1856, and not only visited most parts of the Argentine Republic, but crossed the Andes by a way which had never before been taken by a European. After another brief visit to Germany, he finally settled in Buenos Aires in 1861, where he formed the well-known National Museum of Natural Science. Only an accident made it necessary for him to resign his position as Director, and the community, by which his services were highly appreciated, took care that he was properly pensioned. He was buried at the cost of the State, and the President was present at the funeral.