

SOMEWHERE!

Why should I look from the lattice to-day,
I who am weary of all days to be,
Over the waters that leap in the bay?

He whom I mourn with a passionate pain
Sleeps 'neath the billows that murmur and moan.
What have I left through the years that remain—

Softly a voice from the Infinite calls,
Hushing the wail of my spirit's despair,
Molestedly tender its comforting falls,

T. FERGUSON,

COSMOPOLITAN STANDARD TIME.

Our readers will remember the large gathering of intelligent men from all parts of the United States and Canada which was witnessed in Montreal last June. We refer to the Convention of the American Society of Civil Engineers, on which occasion various scientific and professional papers were discussed.

The Committee have examined the question referred to them, and fully recognize its great public importance. Practically it resolves itself into a proposition to reform our general time system.

Since the subject was brought under the notice of the Society in June last it has been taken into consideration by other associations: by the American Association for the Advancement of Science, at Cincinnati; by the American Meteorological Society, in New York; by the Association for the Reform and Codification of the Law of Nations, at Cologne, Prussia; by the International Geographical Congress, at Venice, Italy.

The members of the Committee have, since their appointment, conferred individually with many persons. They find it admitted on all sides that standard time for general use throughout the country is urgently demanded, and that the time has arrived when action should be taken.

To apprehend that the question is one of importance, it is only necessary to glance at the existing condition of our time service. Mistakes in the hour of the day are frequent. In every State—in every city or town—discrepancies are met which produce great aggregate inconvenience.

These difficulties are not confined to this country. They are experienced in all civilized communities where lines of rapid communication have been established. In the papers before the Committee it is urged that the question is one which affects every nationality, and therefore any change which may be proposed for this country should be such as to commend itself to other nations for adoption, so as ultimately to become universal.

The time system which we follow has been in use for centuries. It certainly answered all the purposes of mankind when there were no railways, no steamboats, and no telegraphs. In some respects the general advancement of civilized communities has outgrown the old custom: the yearly march of events more and more rendering it obsolete, and calling for reform to meet the condition of the age in which we live.

The Committee anticipate difficulty in effecting a desirable reform, as no change in a matter of this kind can be effected without interfering in a greater or less degree with long established usages and fixed habits of thought. The importance of the question, however, appears to the Committee to justify a united effort to obtain as complete a reform as may be desirable and possible.

The Committee feels assured that the general intelligence of the community will cordially sympathize with an earnest movement to bring

about such modifications in our time system as may be practicable and beneficial.

The people of the old world are influenced by traditional customs, and generally are attached to usages on account of their antiquity. They may adhere even to imperfections, which years have made venerable. On this continent this feeling is modified. Americans are not, to the same extent, disposed to cling to conventional forms when these forms interfere with public convenience, or when they retard progress.

If it be considered that the initiation of such a time system as the age demands properly falls within the province of the people of America, it becomes the more necessary that we should make earnest efforts to ascertain not simply what best will meet the requirements of the hour, but what will prove most generally beneficial to our own and succeeding generations throughout the world.

The Committee holds it expedient to obtain an expression of opinion on the various points which present themselves, from as large a number of practical and scientific men as possible. They consider it essential to have the views of those who have been and are now engaged in connection with the great lines of transportation in every State, and Province between the two Oceans.

Accordingly the Committee begs leave to recommend that such papers on Standard Time as it may consider necessary to set forth the subject, be printed, and, all who are prominently connected with Railway and Telegraph enterprises, or are in any way interested in the consideration of the question in the United States, in Canada, and in Mexico, be cordially invited to send replies to the series of questions which have been prepared, with the view of obtaining all shades of opinion.

The Committee more particularly draw attention to propositions 13 to 20 in the scheme which accompanies this.

COSMOPOLITAN SCHEME FOR REGULATING TIME.

1. It is proposed to establish one universal standard time common to all peoples throughout the world, for the use of railways, telegraphs and steamboats, for the purposes of trade and commerce, for general scientific observations, and for every ordinary local purpose.

2. It is proposed that standard time, everywhere, shall be based on the one unit measure of time, denoted by the diurnal revolution of the earth, as determined by the mean solar passage, at one particular meridian to be selected as a time zero.

3. The time zero to coincide with the initial or prime meridian to be common to all nations for computing terrestrial longitude.

4. The time zero and prime meridian of the world to be established with the concurrence of civilized nations generally.

5. For reasons elsewhere given it is suggested that the prime meridian and time zero shall be established through the Pacific Ocean, entirely avoiding the land of any nationality, as shown in the plate.

6. For the purpose of regulating time everywhere it is proposed that the unit measure, determined as above, shall be divided into twenty-four equal parts, and that these parts shall be defined by standard time meridians, established around the globe, fifteen degrees of longitude or one hour distant from each other.

7. It is proposed that the standard time meridians shall be denoted by the letters of the English alphabet, which, omitting J and V, are twenty-four in number. The zero meridian to be lettered Z; the remaining meridians to be lettered in order from east to west, as shown on the plate.

8. It is proposed that standard time, determined as above, shall be employed for general and local purposes in accordance with the following definitions:

STANDARD TIME FOR GENERAL PURPOSES.

9. It is proposed that the unit measure of time, determined as above, shall be held to be a day absolute, and irrespective of the periods of light and darkness which vary with the longitude, to be common to the world for all non-local purposes. To distinguish it from ordinary local days, this space of time may be known as the "Cosmopolitan" or "Cosmic Day."

10. Cosmic time may be used to promote exactness in chronology; it may be employed in astronomy, navigation, meteorology, and in connection with synchronous observations in all parts of the world. It may be regarded as the time which would be used in ocean telegraphy and in all operations of a general or non-local character.

11. It is proposed to distinguish cosmic from local time by denoting the hours of the former by letters, and the latter, as at present, by numerals.

12. It is proposed that cosmic time shall be so lettered that the hours will correspond with the twenty-four standard time meridians. When the sun passes meridians G or N it will be G or N time of the Cosmic day. When it becomes Z time, that is to say, when the (mean) sun passes the zero meridian, at that moment, one cosmic day will end and another begin.

STANDARD TIME FOR LOCAL PURPOSES.

13. It is proposed to constitute the lettered divisions of the cosmic day, standards for regulating local time everywhere. Thus reducing the number of standards to twenty-four and furnishing a ready means of passage from cosmic to local time and from one local to any other local time.

14. It is intended that local time at any place on the surface of the globe shall generally be regulated by the standard meridian nearest or most convenient to such place in longitude.

15. It is proposed that the local day at any place shall commence twelve hours before, and end twelve hours after the (mean) solar passage at the standard meridian which governs the time at that place. Local days, so determined, to be regarded in the same light in all ordinary affairs as local days under the present system.

16. It is proposed that local time at any place or in any section of country shall be known by the letter of the particular standard meridian by which it is governed. If local time at any place or in any section be governed by meridian S it may be known as Standard S time. If by meridian T it may be distinguished as Standard T time and understood to be one hour later than Standard S, two hours later than Standard R, and so on.

THE DISTRIBUTION OF STANDARD TIME.

17. It is proposed that standard time shall be determined and disseminated under Government authority; that time signal stations be established at important centres for the purpose of disseminating correct time with precision, and that all the railway and local public clocks be controlled electrically from the public time stations, or otherwise kept in perfect agreement.

APPLICATION OF THE SYSTEM IN NORTH AMERICA.

18. The adoption of the system in the United States and Canada, would, exclusive of Newfoundland and Alaska, have the effect of reducing the standards of time to four. These four standards, R, S, T and U, precisely one hour apart, would govern the time of the whole country, each would have the simplest possible relation to the other, and all would bear equally simple relations to the other standards of the world.

19. It is not proposed to prescribe the exact limits of the sections of country within which, time would be regulated by each standard. In this matter, general convenience would be the guiding principle. As a rule the division lines would assume a central position between the standard meridians. There would be no difficulty in finding division lines either natural, political or commercial, which would fall about midway between each of the four meridians. Probably in some cases a city or town may lie equidistant from two meridians. In such cases geographical considerations, business relations, and other local circumstances, would decide which standard should be adopted. The time used by the railways would be determined by precisely similar considerations. The time tables and railway clocks would always clearly indicate the standards which regulated the running of trains over particular sections.

20. It is suggested that standard time would generally prevail in the several states and provinces as follows:

Table with 4 columns: STANDARD TIME, MERIDIAN R; STANDARD TIME, MERIDIAN S; STANDARD TIME, MERIDIAN T; STANDARD TIME, MERIDIAN U. Lists states and provinces corresponding to each meridian.

21. Reference to the diagram will show that the four meridians, U, T, S and R, at intervals each from the other of one hour, would effectively regulate the time of day throughout the whole extent of the United States, Canada and Mexico. But the number of standards can be increased or reduced without interference with the harmony, and cosmopolitan applica-

tion of the general scheme. Theories have been advanced, still further to reduce the number of standards. If two standards be deemed expedient meridians U and R may be selected; one adapted to the eastern, the second to the western half of the Continent. If on the other hand the opinion prevail, that there should be one uniform time for the whole North American Continent, meridian S might be selected. Meridian S would be 90° to the east of the Prime Meridian proposed for all nations. It would pass through Lake Superior and the Mississippi Valley to the Gulf of Mexico. It would be generally central, and would best suit the great body of the population.

The Society of Civil Engineers are now inviting the co-operation of all persons engaged in connection with the railways and telegraphs of the country, and all other persons and associations throughout the United States, Canada and Mexico, interested in the question. A series of questions have been issued to which replies are cordially solicited in order that all shades of opinion may be obtained and thus the general voice of the country secured. This step is preliminary to a convention to be held in Washington for the purpose of determining the time system which it would be advisable to adopt for the whole continent. The Governments of Canada and Mexico, the various State Governments and the various departments of the General Government of the United States are intended to be represented at the convention.

THE CHANNEL TUNNEL.

We present a series of Sketches and Illustrations of the Channel Tunnel Works, at Dover, recently commenced by the Submarine Continental Railway Company, of which Sir Edward Watkin, Bart., M.P., Chairman of the South-Eastern Railway Company, is the presiding director. On Saturday, 8th March, Sir Edward Watkin conducted a party of thirty or forty gentlemen from London to inspect these works, the Lord Mayor of London being one of the party. They descended the shaft, walked a thousand yards under the sea, and admired the working of Colonel Beaumont's compressed-air boring machine. They had the electric light, by which the tunnel was illuminated end to end. The shaft is sunk in the chalk cliff at the foot of the "Shakespeare Cliff," between Folkestone and Dover, and is about one hundred and sixty feet deep. The opening is circular, with boarded sides, and the descending apparatus is worked by a steam-engine. At the bottom of this shaft is a square chamber dug in the grey chalk, the sides of which are protected by heavy beams; and in front is the experimental boring, a low-roofed circular tunnel, about seven feet in diameter, the floor of which is laid with a double line of tramrails. This tunnel is admirably ventilated, and on visiting days is lighted with electric lamps, the steam-power at the mouth of the shaft being sufficient for all purposes. The stratum through which the experimental borings have been made is the lower grey chalk. This material, while perfectly dry, and very easily worked, is sufficiently hard to dispel any apprehensions of crumbling or falling in.

The length of the Tunnel, under sea, from the English to the French shore, will be twenty-two miles; and, taking the shore approaches at four miles on each side, there will be a total length of thirty miles of tunnelling. The approach tunnel descends from the daylight surface by an inclosed gallery, with an incline of 1 in 80, towards Dover, to the South Eastern Railway Company's line, about two miles and a half from Folkestone. The exact point is at the western end of the Abbot's Cliff tunnel, at which point the gault clay out-crops to the sea level. Half a mile of heading has been driven, by machinery, from this point; after which, the work was suspended, to enable them to be resumed at a point nearer to Shakespeare's Cliff, where the tunnel passes under the sea. It is the shaft at this point that is represented in our Engraving.

At the end of the tunnel the visitors found one of the Beaumont and English compressed-air boring machines at work. The length of this machine from the borer to the tail end is about 33 ft. Its work is done by the cutting action of short steel cutters fixed in two revolving arms, seven cutters in each, the upper portion of the frame in which the borer is fixed moving forward 5-16ths of an inch with every complete revolution of the cutters. In this way a thin paring from the whole face of the chalk in front in front is cut away with every turn of the borer. A circular tunnel is formed having a diameter of 7 ft. A man in front shovels the crumbled debris into small buckets, which, travelling on an endless band, shoot the dirt into a "skip" tended by another man. The skip when filled is run along a tramway to the mouth of the shaft. At present these trolleys each holding about one third of a cubic yard, are drawn by men; but before long it is hoped that small compressed air-engines will be used for traction. The rate of progress made with the machine is about one hundred yards per week, but will soon be much accelerated. As worked at present, the number of revolutions it makes is two or three per minute, which, as the advance by each revolution is 5-16ths of an inch, amounts to boring nearly an inch a minute while the machine is at work. But Colonel Beaumont anticipates no difficulty in making the machine cut its way at the rate of 3-8ths of an inch per revolution, and getting five revolutions per minute, which would give a rate of advance of two inches per minute. When the tunnel is opened for traffic, the trains will