

MINUTES OF EVIDENCE.

WELLINGTON: TUESDAY, 19TH AUGUST, 1924.

Mr. W. T. NEILL, Surveyor-General, examined. (No. 1.)

The Acting-Chairman.] Your full name?—William Thomson Neill.

And your designation?—Surveyor-General.

Will you make a statement?—Yes, sir. The more important factors to be taken into consideration in determining the fundamental principles on which legal time should be determined so as to effect the saving of daylight in a country situated like New Zealand are the inclinations which the central axis makes with the line of simultaneous rising and setting of the sun throughout the year, and the choosing of the meridians which will give the best result and to which the times are referred to. The effects of dawn and twilight are unimportant and need not be taken into account. The Dominion covers a breadth of nearly 12° of longitude, from about $178^{\circ} 36'$ east at the East Cape to about $166^{\circ} 26'$ east at the West Cape in the Sounds district. The local times at the East Cape and West Cape are, therefore, 11 hours 54 minutes and 11 hours 6 minutes respectively fast on Greenwich, or a range of a little over three-quarters of an hour. Again, the country is contained between the parallels of 34° and 47° south latitude, and the difference in the times of sunrise at a place in 34° latitude and another place on the same meridian in latitude 47° at midsummer is about three-quarters of an hour. I would refer you to the map herewith [Map handed in]. This map shows the front of the advancing wave of light arriving at the East Cape at the summer solstice by the red line marked "Summer rising," and as this line is nearly parallel to the central axis, all zones parallel to the line of summer rising receive daylight about the same time. Further, the line marked "Summer setting" is shown to make a large angle with the central axis, the consequence being that the northern places lose daylight before those situated more to the south, thus West Cape loses the sun about seventy minutes later than East Cape. It is now obvious that the meridian to which summer time should be referred ought to lie to the east of the Dominion if the best result is sought in order to counteract the early setting-in of darkness in the northern latitudes. By similar reasoning, as regards the simultaneous rising and setting of the sun at the winter solstice shown by green lines on the map, the conclusion arrived at is that the meridian which will give the best result during the winter months should lie to the west of the Dominion. With regard to the New Zealand standard time at present, the New Zealand standard time, 11 hours 30 minutes fast of Greenwich was adopted in 1868 on the advice of Sir James Hector, who was asked by the Government in that year to submit proposals for a standard time suitable for use throughout the colony, the development of the railway and telegraph systems having rendered the diversity of times previously prevailing in the country most inconvenient. A recommendation in 1891 was made that New Zealand standard time should be eleven hours in advance of Greenwich in conformity with the international time agreement for exact hours different from Greenwich. A further recommendation in 1917 was made by the Wellington Philosophical Society that New Zealand standard time should be twelve hours in advance of Greenwich. The adoption of either of the above recommendations separately would not assist in the saving of daylight. Choice of meridians: It has been shown above by astronomical considerations alone that the meridians on which summer time and winter time should be based must lie respectively to the eastward and westward of the Dominion. If one hour is agreed upon as the difference of legal time between the winter and summer seasons the meridians to be adopted are evidently 11 hours in winter and 12 hours in summer in advance of Greenwich. The present standard time could be altered to agree with the legal summer time if considered desirable, and provision should be made for continuing Greenwich time for astronomical and other scientific purposes, as is done in the British Legal Time Bill. If eleven hours in winter and twelve hours in summer in advance of Greenwich were adopted, the difference between the legal times of this Dominion and Great Britain would be ten hours during the winter and twelve hours during the summer. I will now refer to the social and industrial advantages and disadvantages. The principal social and industrial advantages to be gained by the adoption of the above-described times of 11 hours in winter and 12 hours in summer in advance of Greenwich are that in winter the working-man and the farmer, who has now to rise and have breakfast for some three months in the year by artificial light, would have that period shortened by half an hour, and it is in the morning that artificial light is obligatory. Newspapers would gain the advantage for a portion of the year, of being ten hours ahead of Great Britain instead of $11\frac{1}{2}$ hours, and one hour ahead of Australia instead of one hour and a half as at present. These advantages, however, would be offset by the disadvantages of being twelve hours ahead of Great Britain and two hours ahead of Australia during the summer. Artificial lighting of cities would begin half an hour sooner in the winter months than at present, and as darkness takes place about the same time on all zones parallel to the central axis, this disadvantage applies equally to the whole Dominion. In summer the working-day would close half an hour sooner than at present, and all members of the community would have an extra half-hour of daylight to indulge in outdoor pastimes. Margin of daylight: At midsummer the mean excess of daylight over twelve hours, including twilight and dawn, for the mid-latitude of 41° is seven hours and forty minutes, and at the equinox the margin diminishes to two hours and ten minutes. It is apparent from these figures that by retaining the meridian of 11 hours in advance of Greenwich an advance of the clock of two hours during the summer could be made if considered desirable. It may be mentioned incidentally that daylight-saving measures are only suitable for adoption in countries within the temperate zones, where the difference between the lengths of the day