

3. I would suggest the advisability of not only considering a seasonal time for summer, but for winter and summer simultaneously, so as to improve, if possible, the efficiency of our industrial winter working-hours in addition to our summer enjoyment hours.

4. The subject is peculiarly involved in relation to our farming community at places situated east and west of our time meridian, and I would submit that the opinions of such persons as the Government Astronomer, Dr. Marsden, Professor Sommerville, and some other scientific gentlemen who have deeply studied time problems within this Dominion would be of much value.

GEORGE HOOPER, Nautical Adviser.

Nautical Adviser's Office, Customhouse, Wellington, 20th August, 1924.

Memorandum for the Secretary, Marine Department, Wellington.

*Re SUMMER TIME.*

ADVERTING to my letter of the 19th ultimo, I submit herewith, in graphic form, the times of sunrise and sunset at Auckland, Wellington, Christchurch, and Dunedin; also, at Otautau, Southland, a very westerly settlement, and at East Cape, a most easterly settlement.

The graph covers the period between the 1st of September, 1924, and the 31st October, 1925. A glance at the graph will immediately show the length of the day at any of those places on any day of the year, this being the vertical measure of the squares between the upper and lower black curves; whereas the length of the night is ascertainable by subtracting the length of the day from twenty-four hours. The length of the forenoon at any place on any date is easily found by reading in the margin the hours and minutes of the horizontal line cutting the curve on the date required and subtracting this from twelve hours. The length of the afternoon may be read from the margin directly.

Assuming the majority of industrial work of the Dominion to be performed between the hours of 8 a.m. and 5 p.m., it will be seen by the graph that such work might easily be performed within the hours of natural light at any place within the Dominion during the greater portion of the year. However, curves on the graph under the months of May, June, and July will show that during the midwinter at some of the places it would be impossible to perform the usual hours of work without the aid of artificial light, as, for instance, at Otautau, Southland, where the sun rises at 8 a.m. and sets at 4 p.m., a circumstance clearly defying any desire to avoid using artificial light during ordinary working-hours; whereas at the same period at Auckland the entire hours of daily labour, some of which are now performed by artificial light after sunset, could be embraced within natural light hours throughout the winter months by a slight adjustment of the times at commencement and termination of work; not necessarily any interference with any existing clock or other time-indicating devices.

The necessity for illuminating workshops, factories, stores, warehouses, sheds, and other places where work usually ceases at 5 p.m. for the last half-hour in the day could be eliminated on most days, clearly a significant saving at peak-load hours.

The curve will show that a slight adjustment of the starting and finishing times for workers (apart from the orthodox times of 8 a.m. and 5 p.m. starting and finishing times of work) at other places during the winter months would enable a similar achievement to be accomplished in respect of those places.

The efficiency of the workers in most industries would appear to be capable of easier attainment when their work is performed under natural light conditions, and the effect of working under artificial light on the eyesight of youthful workers of both sexes is evidenced in many directions. To utilize in industry to its fullest extent the full period of available daylight would appear to be a true form of daylight-saving, and from the graph it would appear that the most benefit to be derived from any system of daylight-saving would be most pronounced during the winter months.

The benefits or non-benefits attributed to early rising are problematical, and it has not been advanced in its favour that much benefit is obtained to persons who habitually are out and about at their occupations during the periods of early morning before the sun has exercised its full radiating effect on the earth's surface. It certainly is experienced as much more congenial to be out and about after the sun has risen for some hours, but the actual benefits or non-benefits of this have so far not been fully emphasized.

It must not be overlooked that to an observer the actual commencement and termination of the daylight period varies somewhat indefinitely at different places and at different times of the year, as the crepuscular or twilight period in that place varies in accordance with the departure of the sun's apparent path from a vertical circle when rising or setting. It may be of interest to know that the duration of midsummer twilight at Auckland in the north is one hour fifty-seven minutes, and at Otautau in the south-west is two hours fifty minutes; whilst the midwinter twilight at Auckland is one hour and thirty-nine minutes, and at Otautau it is one hour and fifty-five minutes.

I do think if any alteration in the time of the community is made that such should be performed comprehensive throughout all the seasons of the year, and should not be confined to summer-time alone, although the proposed alteration to advance the clock one hour during the summer months is very commendable and I think would result in much benefit to the community. I have not yet heard of any valid objection to the proposal.

GEORGE HOOPER, Nautical Adviser.

THE ASSOCIATION OF NEW ZEALAND CHAMBERS OF COMMERCE.

REMITTS in favour of adoption of a system of daylight-saving by means of setting forward the clock for a definite period have been adopted by the individual Chambers of Commerce on various occasions. The matter was introduced in the Conference of Chambers of Commerce in 1922, the following remits being introduced and passed:—

"That this Conference supports the endeavour to have the clocks moved forward half an hour in order that New Zealand mean time will be exactly twelve hours in advance of Greenwich time."

"For the purposes of daylight-saving during the summer months the clock be set forward one hour from the 1st October to the 31st March each year."

Last year a remit as under was considered and adopted:—

"That Government again be urged to bring in a Daylight-saving Bill, advancing the clock one hour in summer."

It should be noted that the association is thoroughly representative of commerce throughout the Dominion, membership being by no means confined to the chief centres. Arguments in favour were fully advanced, and the remits were adopted by the Conference only after full discussion.

The advantages to dwellers in the cities are surely obvious, and the absence of protest from delegates from the smaller country towns seems to indicate that they at least see no valid objection so far as they are concerned. As regards the hardship to the farmers, of which a great deal has been said, I personally can see little in the objections. Surely it would make little difference to them, as, in any case, they work according to the daylight, not according to the clock. Moreover, after years of operation in Great Britain, evidence taken showed that the majority approve, and in America, where a special or local option obtains in regard to this matter, scores of farming districts voted in favour of the measure. Through changed conditions, there is not now the same need for farmers to catch milk-trains or be at milk-factories by a very early hour. Home separating or the growth of butter-factories, as distinct from milk-factories, have, I am informed, altered this to a great extent, as has also motor traction.