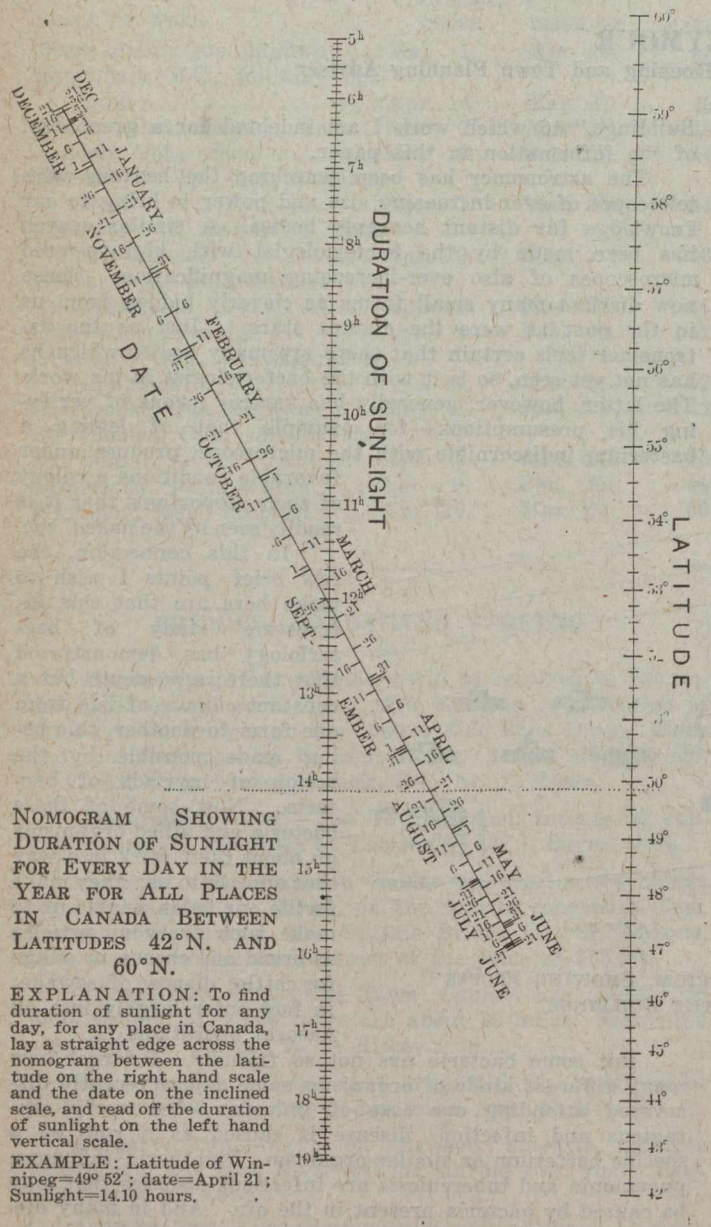
in the city air, which as a rule is shut off from direct sunlight.

"Second only to air is light and sunshine essential for growth and health, and it is one of nature's most powerful assistants in enabling the body to throw off these conditions which we call disease. Not only daylight but sunlight; indeed fresh air must be sun-warmed, sun-penetrated air. The sunshine of a December day has been recently shown to kill the spores of the anthrax bacillus." (Healthy Hospitals, Sir Douglas Galton, Oxford, 1893). This latter is no mean performance when one remembers that bacterial spores or "seeds" are protected with a hard casing which render them much more difficult to destroy than the parent bacteria.

Besides being nature's great preventative for the spread of disease, we all have felt the exhilarating effect of sunlight and know its general effect on public health and




NOMOGRAM SHOWING DURATION OF SUNLIGHT FOR EVERY DAY IN THE YEAR FOR ALL PLACES IN CANADA BETWEEN LATITUDES 42°N. AND 60°N.

EXPLANATION: To find duration of sunlight for any day, for any place in Canada, lay a straight edge across the nomogram between the latitude on the right hand scale and the date on the inclined scale, and read off the duration of sunlight on the left hand vertical scale.

EXAMPLE: Latitude of Winnipeg=49° 52′; date=April 21; Sunlight=14.10 hours.

sanitation, and having the matter brought to our attention, we can realize what would be its effect on the removal of snow in the winter and generally on street traffic conditions.

"Unquestionably one of the first requisites for a healthy building is abundance of sunlight. Not only the exterior wall surfaces of the buildings but also the surface of the ground around them should have the direct rays of the sun for as long a time as possible each day," says Atkinson.

If you do not agree with his conclusions, I have no time for further argument. But I assume that you do, and will pass on to the considerations of the astronomical data.

The path of the sun during the four months from April 21st to August 21st, resembles more nearly his path at the summer solstice than at the equinoxes, and similarly his path during the four months from October 21st to February 21st, more nearly his path at the winter solstice than his path at the equinoxes. Or, the condition of the winter solstice may be considered as fairly typical of the period of the four months from October 21st to February 21st. For the northern climes this is the period for which special planning is necessary, as can be judged from the following reasons, with which you are all very familiar but which will bear some elaboration.

### Reasons for Special Planning

1.—At the winter solstice, the days are the shortest, which means that the total possible amount of sunlight that may be received per day is the least in the year. From the accompanying nomogram, prepared in the surveyor-general's office, the duration of sunlight in Canadian latitudes can be quickly determined. The effect of latitude on the length of the day is readily apparent:—

| | Lat. | Duration of sunlight |
|---|---|---|
| At the summer solstice | 42° | 15.25 hours |
| " " " " | 60° | 18.90 hours |
| At the winter solstice | 42° | 9.10 hours |
| " " " " | 60° | 5.85 hours |

2.—At the winter solstice, the sun's rays are most oblique. As you know, the intensity of heat and light received from the sun is greatest as the rays become most nearly vertical. We find then that not only the total amount, but also the intensity, of the sunlight received in winter is less than that received in summer. That we should plan to conserve all the sunlight we receive in the northern climes in the winter is the obvious conclusion. If we do this, we will be amply rewarded. We must remember that Sir Douglas Galton makes the statement that "the sunshine of a December day has been recently shown to kill the spores of the anthrax bacillus."

A record of the temperatures in two sun-boxes (small insulated boxes with glass fronts, one faced east and one south) indicates what the December sun can do compared with his ability in July and the other months.

In December, in latitude 42° 40′ N., with an actual outside temperature of 25°F., there was recorded a maximum temperature of 115°F. in the box facing south, while in July, with an outside temperature of 90°F., the maximum temperature in this box was only 112°F., or actually 3°F. lower; in the box facing east, 122°F., or but 7°F. higher.

Mr. Atkinson also instances the case of a small "shack" in latitude 42±°N., with glass front facing south, and says thereof:—"A temperature of over 100°F., has been frequently obtained within this building with an outside temperature of zero or lower, entirely from the warmth of the sun's rays."

### New York's Skyscrapers

3.—At the winter solstice, the shadows cast are the longest and cover the greatest area. In this connection some facts are of interest as to some of the New York skyscrapers. These facts and others in this paper are abstracted from recent papers by Messrs. Swan and Tuttle on "Planning Sunlight Cities" and "Sunlight Engineering in City Planning and Housing."

At noon December 21st, the Woolworth Tower, 791 ft. high, casts a shadow of 1,635 ft. in length.

The Equitable Building at the same time, being 493 ft. high with a ground area of 1.14 acres, casts a shadow 1,018 ft. long, covering an area of 7.79 acres, with the result that the fronts of facades of many tall buildings are completely shaded all day.

The street on the north of the Equitable Building is 34 ft. wide. If this north and south street were built up of Equitable Buildings, then "not a single window within 447 ft. of the street level would receive a ray of direct sunlight on December 21st."

At noon on December 21st the altitude of the sun is, at the places named, approximately as follows:—At the equator, 66.6°; at Winnipeg, 16.6°; at Edmonton, 13.0°.