DISCUSSION AND CORRESPONDENCE

WHEN DOES WINTER COME?

IN connection with the proposed thirteen-month calendar it has been suggested that the first day of the year should be December 22 so as to coincide with the beginning of the winter. A change in the year as a whole will be a very appreciable addition to the other inconveniences necessarily accompanying a change of calendar, and ought to be made in the most satisfactory way if the inconvenience is to be incurred at all. Moreover, at present some extra labor results when meteorological data for the different seasons are referred to dates which do not coincide with the beginnings of months. This trouble is wasted if the choice of dates is not a happy one. It therefore seems interesting to show that the not infrequent practice of beginning the seasons on the 21st or 22d of December, March, June and September (that is, at the solstices and equinoxes), is not only not the best but is actually worse, and a good deal worse, than to begin them with the beginnings of certain months.

The solstices and equinoxes are astronomical phenomena; the seasons are meteorological phenomena, governed by the astronomical events, but not coinciding with them. The winter solstice, for instance, the 21st or 22d of December, is astronomically not the beginning of winter at all, but the middle of winter. To use the middle of one kind of winter as the beginning of another kind has something illogical about it. If it should really be the case that the 21st of December were an appropriate beginning of the meteorological winter, the real, weather winter, a clear-headed person might even regard the coincidence as a cause of confusion and might feel moved to explain that there was a coincidence between two events which readily were of a different character. But if the meteorological winter does not begin on the 21st of December at all, then those who should assign its beginning to the 21st of December would be setting false limits to the winter in order that thereby they might begin it on an illogical and confusing date.

The only practical criterion of the meteorological winter appears to be the temperature. Since temperatures differ in different years and also in different parts of the temperate zone, the determination of the best dates for beginning and ending seasons is necessarily a statistical matter. For this statistical process, however, abundant data are at hand and a result can easily be obtained which, in view of the variations occurring in any one year, would generally be considered quite satisfactory. A curve which has been drawn for the climate of Washington probably coincides nearly enough with the average climate of the temperate zone as far as the beginnings and endings of the seasons are concerned to serve as an illustration here. According to this curve the average coldest day of the year is, within a day or so, the 21st of January; the average coldest 90 days runs from the 7th of December to the 7th of March. Similarly, the middle of summer is very close to the 21st of July, with the whole summer running from the 7th of June to the 7th of September.

It thus appears that by illogically tying up the beginning of one kind of winter with the middle of another, and by splitting months in meteorological calculations dealing with the seasons, we actually may be twice as far away from the real seasons of nature as if we counted those seasons from the first of December, March, June and September.

The practice of beginning the seasons with the solstices and equinoxes seems also to be in conflict with the prevailing usage of the past. The 21st of December, for instance, is called the *winter* solstice, which is an appropriate name if it comes within the winter astronomically and meteorologically, as it really does. But as the beginning of winter it has no right to this name. It thus would be the autumn-winter solstice.

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ELEMENTARY TEXT-BOOKS OF PHYSICS

HAS the text-book of college physics kept pace with the rapid strides which the science as a whole has taken? To be sure, in the revised editions of the older texts, one finds additional paragraphs dealing with twentieth century developments. Indeed, one recent book devotes the last fifth of its pages to the "new physics." But is not this segregation of the new material a confession that the treatment as a whole is from the old point of view? On my shelf there is a text-book of college physics copyrighted within the last year which has essentially the same table of contents as an edition of Ganot's "Physics" of over fifty years ago. Do not the customary subdivisions, mechanics, sound, light, etc., imply that still the physicist deals with the world of nature directly with his hands and ears and eyes? Is there not need to reorganize the treatment to better emphasize those fundamental relations and principles which, to be sure, appear to the senses in many varied forms, yet really constitute the science of physics from the modern point of view?

Many a college freshman who has been introduced to the subject-matter of physics from the practical point of view in a secondary school course has sufficient experience and background to be taken behind