following quotations are taken, does not indicate that it is supported by many distinguished men of science. It was testified that the "Science Guild" of which Sir Norman Lockyer is chairman, and which is composed of "scientific people or people who take an interest in science" feels "that it is a great mistake to tamper with time." The bill was strongly opposed by Sir William H. M. Christie, the astronomer royal, and Sir David Gill, who was recently his majesty's astronomer at the Cape of Good Hope. It was through the influence and active work of the latter that standard time was substituted for local time in South Africa in 1903. The bill was favored by Professor Rambaut, professor of astronomy in the University of Dublin, and Sir Robert S. Ball, formerly astronomer royal of Ireland, but both of these gentlemen strongly opposed the proposition to set the clocks one hour ahead. They favored the idea of making three changes of twenty minutes for the summer, returning to Greenwich mean time for the winter; in other words, the long-hour and short-hour plan. To this the practical objections are very great and it is understood that its advocacy before parliament has now been definitely abandoned.

Sir William H. M. Christie called attention to the fact that neither Sir Robert Ball nor Professor Rambaut, when in Ireland, had "succeeded in persuading their countrymen of the advantages of early rising which might have been secured by substituting Greenwich for Dublin time, the Irish clocks being thus put twenty-five minutes forward," although they tried to do so.

The tenor of all the arguments in favor of the bill was that many persons would be deceived into getting up earlier by setting the clocks ahead when they could not be persuaded to do so otherwise.

It is reported in the daily papers that many English employers have voluntarily arranged to have the day's work of their employes commence a half hour or an hour earlier in the summer, thus securing honestly the advantage it is claimed people would gain by changing the clocks and without "juggling with the uniform measurement of time" as Sir William Christie properly terms it.

When the mass of the English people come to fully realize that by shifting the clocks an hour ahead they will be adopting a time *made in Germany,* perhaps their patriotic impulses will induce them to come to the assistance of common-sense people and make any attempt to pass the so-called "Daylight Saving Bill" absolutely hopeless. W. F. A.

NEW YORK CITY

A REMARKABLE AURORA BOREALIS

ONE of the brightest auroras seen in recent years at Blue Hill Observatory was visible for several hours on the evening of May 15 last. When first observed, at 8:58 P.M., it formed three detached luminous patches, the two brightest having been near the zenith. At 9:10 P.M. the latter two merged to form one large bluish-gray mass, of unusual brightness. After that, the luminosity changed rapidly from moment to moment, while the form was altered but slightly, the whole mass moving slowly to the south and west. For about three quarters of an hour the main mass took the shape of a long-handled dipper, the bowl appearing like the head, and the handle like the tail of a huge comet, which many people thought the phenomenon to be. At 10:36 P.M. it was seen as five detached areas of light, which, after about ten minutes, joined to form an unbroken arch which reached from west to east almost entirely across the sky, the highest point passing slightly to the south of the zenith. After 11 o'clock the arch broke up into separate masses which changed in brilliancy from time to time, but gradually faded until all had disappeared by 11:30 P.M. In the two hours from 8:59 P.M. to 10:59 P.M. the mass moved as a whole about 25° toward the south and about 50° toward the west, as measured from a point near the center of the main mass which was originally about 5° to the north of the zenith. After 10 o'clock we had the unusual condition of the "northern lights" entirely to the south of a west-to-east line through the zenith. It is also worthy of note that the southern border was at all times a

distinct and clean-cut line, while the northern border was everywhere indefinite, gradually dying out at about 30° to the north of the zenith. During the course of the evening the luminous area varied in width from 10° to about 35°.

The aurora was remarkable on account of its unusual position, its rapid changes in brilliancy, and its varying shape. The color was a pale bluish-gray, no iridescence having been seen at any time. Moreover, there was no suggestion of streamers or rapidly-moving iridescent patches, often referred to as "merry-dancers." When the aurora was at its maximum brilliancy, only the stars of brightest magnitude could be seen in that region of the sky, and the "milky way" was rendered entirely invisible. Over nine tenths of the sky was cloudless throughout the evening; a trace of alto-stratus cloud having been visible above the northern horizon, and an equal amount of cumulo-nimbus cloud with distant lightning having been seen far off to the west.

Andrew H. Palmer
Blue Hill Observatory,
May 17, 1909

SCIENTIFIC BOOKS

Elements of Optical Mineralogy, An Introduction to Microscopic Petrography. By N. H. Winchell and Alexander N. Winchell. New York, D. Van Nostrand Company. 1908. Pp. 502; 350 figures; 4 plates. Price, $3.50.

During the last few years several excellent treatises on optical mineralogy by Americans have appeared, namely, those by Luquer, Iddings and Johannsen. According to the authors, none of these contains a concise and clear exposition of the principles, methods and data of optical mineralogy. It is to supply this want that this text was written.

The book is divided into three parts, as follows: (1) Principles and Methods, (2) Description of Minerals and (3) Analytical Tables.

In part one, seventeen pages are devoted to some of the phenomena of light, twenty-two pages to the elements of mineralogy, and fifty-nine pages to the application of polarized light to crystalline substances. Part two contains a systematic description of all the rock-forming minerals concerning which there is sufficient data to permit their being determined by means of the microscope. These descriptions occupy 310 pages. Part three is made up of exhaustive analytical tables for determination, microscopically, of rock-forming minerals. The tables extend over fifty-seven pages.

There are also three appendices, as follows: (1) Optical Study of Opaque Minerals —ten pages, (2) Microchemical Methods—nine pages, and (3) A Partial Bibliography—two pages.

There will be, undoubtedly, much difference of opinion among petrographers and physical crystallographers as to whether the authors have succeeded in presenting the principles and methods, fundamental to a clear understanding of the physical properties of rock-forming minerals, "concisely and clearly." To be sure, they have been treated concisely, but only in a few cases clearly. Thus, the description of the nicol prism, a thorough understanding of which is absolutely essential, is intelligible only to those who have had some previous knowledge of it and know what to expect. Certainly a beginner can obtain no clear conception of it. Furthermore, the description is not entirely accurate, as is shown by the following sentence, lines 7 to 10, page 16: "The cut faces, after polishing, are cemented together again in their original position by Canada balsam—*which has nearly the same index of refraction as the Iceland spar*" (the italics are the reviewer's).

The statement, page 8, that the most exact method of applying total reflection to the determination of the index of refraction is the Kohlrausch method, is misleading, as any one who has had experience in applying it knows. Line 9, page 9, should read "the axis of the observing telescope *OT* is the line of the *reflected* ray," instead of the incident ray. Fig. 3*c*, accompanying this description, is poorly executed, the line *ON* being by no means normal to the plate *OD*. In fact, many of the