in Scotland, chalk at Stonehenge, earth in Cornwall.

Now while "cists" are common to Scotland, Dartmoor and Cornwall, the "chambered cairn" or cromlech is in Scotland special to the west coast. I do not know at present whether there is any representative of it nearer to Aberdeen than Callernish or Stenness. The difference between the east and west coast of Scotland is thus strongly emphasised, and the view of a difference of time in the building operations is strengthened.

I now return for a moment from the side-lights to the clock-star conditions, in order to give a table of the measurements, from which the declinations of the stars were determined by means of a curve connecting azimuth and declination, for different elevations of the horizon, for the general latitude of 57° N.; consequently the measurements are not final, but are sufficiently accurate for a preliminary discussion.

Between 2000 B.C. and 1 B.C Arcturus and Capella were the only first-magnitude stars to come within the declination range shown in the table, and, as my results show that they were used as clock-stars in Cornwall and Devon, I consider that the evidence in their favour warrants the assumption that one of them was used as a clock-star by the circle-builders of Aberdeenshire. I give the dates for both.

Circles at—	Azimuths		Elevation of the horizon	Declination N.	Dates B.C.	
	Magnetic, mean of observations	True, at right-angles across circle			Arcturus	Capella
	° ′	° ′	°	° ′		
Braehead Leslie... ...	132 20	N. 23 35 E.	1½	30 58	250	2000
Leylodge	123 0	N. 14 15 E.	0	31 18	330	1940
Loudon Wood	120 40	N. 11 55 E.	0	31 38	370	1890
Tomnagorn	124 0	N. 15 15 E.	½?	31 42	390	1860
Wanton Wells	130 30	N. 21 45 E.	2	31 52	420	1830
Old Keig	138 0	N. 29 15 E.	4	31 55	430	1820
South Fornet	116 48	N. 8 3 E.	0	32 4	450	1800
Nether Boddam... ..	130 0	N. 21 15 E.	2	32 8	460	1790
Aikey Brae...	113 0	N. 4 15 E.	0	32 18	500	1760
Castle Fraser	129 36	N. 20 51 E.	2½	32 42	570	1680
New Craig	129 34	N. 20 49 E.	2½	32 43	570	1680
Loanhead of Daviot...	116 45	N. 8 0 E.	1	33 14	660	1580
Kirkton of Bourtie ...	123 30	N. 14 45 E.	2½	33 57	770	1460
Cothie Muir	127 40	N. 18 55 E.	4	34 42	920	1300
Eslie the Greater ...	113 30	N. 4 45 E.	2½	35 5	980	1230

In future notes, after referring to some more "side-lights," I shall give the measurements of the May-year and solstitial circles.

NORMAN LOCKYER.

PROPOSED ALTERATION IN THE CALENDAR.

THE last great alteration in the calendar was that which was known as the Gregorian Reformation. It was promulgated in 1582, and at once accepted in all countries which were under the Roman obedience in ecclesiastical matters, but only gradually adopted by those belonging to the Reformed Western Church (which are all usually called Protestant, though that term strictly pertains to the Lutherans only), whilst the Eastern Church adheres still to the old Julian style.

Now it is often forgotten that the change then made was two-fold, the two parts having really no reference to each other, and the assertion frequently made that the Gregorian calendar was constructed, or nearly so, to agree with the astronomical length of the year, applies to only one of these changes, the other, which made a violent hiatus in the succession of days, being effected with a totally different object. For if the year were to be assigned its true length and not the $365\frac{1}{4}$ days decreed by Julius Cæsar, it would at first sight have seemed most natural to choose a convenient epoch, such as the end of a century, and simply arrange the omission of a leap-year at certain stated times from that. (Here we may parenthetically remark that a regulation to drop a leap-year at the end of each 132nd year would have been more accurate, and quite as simple as that actually adopted.) But it was also thought necessary to bring back the vernal equinox to the date it occupied, not at the Christian era, but at the time of the Council of Nicæa in the fourth century. Hence ten days were omitted from the current sequence, and when England came into line with other western countries, eleven days were omitted in 1752. This, of course, makes great care necessary in comparing events as given in English and Continental narratives between 1582 and 1752.

The change now proposed, and recently brought before the House of Commons by Mr. Pearce, is of a much more drastic kind. It is not a reformation of the Gregorian calendar as regards the length of the year (and a small change of the rule, as already mentioned, would improve its accuracy at long intervals), but a proposal to alter the succession of the days of the week and of the month to secure a degree of symmetry in their correspondence, and an equality in the four quarters of the year. Thus the first of January and the leap-year day, which, however, is to be, not in February, but in June, have each to be considered in every respect a *dies non*; if either falls on a Sunday, not that day, but the next is to be reckoned as Sunday, which, of course, would occasionally throw Sunday one day, or even two days, ahead of its place in the sequence of seven days.

Now it may safely be affirmed that, not only for its practical inconvenience and disturbance of the uniformity and continuity which are so desirable in a calendar, but for other reasons also, even more weighty, this alteration can never be accepted in Christian countries, nor could it commend itself if we began *de novo*.

As regards the days of the month, the case is different. The existing arrangement was a perversion of that decreed by Julius Cæsar. He ordained that the year should begin with January, the 1st being the day of new moon nearest the winter solstice when the change was made, and that that month should have thirty-one days and each alternate month afterwards, the rest to have thirty, excepting February, which should have twenty-nine days in common years and thirty days in leap-years, to fall *every* fourth year. In the reign of Augustus, who looked upon August as his special month, though it was not that of his birth, the convenient and easily to be remembered arrangement of Julius was altered in order that August might have as many days as July. By the earlier arrangement the days of the successive months were 31, 29 (or 30), 31, 30, 31, 30, 31, 30, 31, 30, 31, 30; by the later (now followed), 31, 28 (or 29), 31, 30, 31, 30, 31, 31, 30, 31, 30, 31.

No doubt Cæsar placed the leap-day in February because that had been the last month of the year in the old Roman calendar. There would be no harm, if we were starting afresh, in placing it in June as proposed by Mr. Pearce; but it would injure continuity (always a desirable thing in itself) and not attain his object unless the day, as well as New Year's Day, were made a *dies non*, both in the week and in the

month. Neither of these would be convenient; the first is, for other reasons also, inadmissible.

On one point we agree with Mr. Pearce, and that is as regards the incidence of Easter. There is a common, but false, impression that the existing cumbrous arrangement has the authority of the Council of Nicæa. All that that council decreed was, in opposition to the so-called Quartodecimans, that Easter should always be kept on a Sunday; the particular Sunday was regulated by various cycles, the Metonic being usually followed, and the present rule was initiated by the advisers of Pope Gregory XIII., the English Prayer-Book rule arriving at the same end, when our calendar was reformed, by a slightly different process. It has not secured uniformity in Christendom because the Eastern church still follows the Julian calendar, and therefore its Easter is usually different from ours. A rule to keep Easter on the second Sunday in April (when the first Easter in all probability fell) would be very convenient, but it is an ecclesiastical question, and the alteration should be the act of the whole church. To make it always on the same day of the month, as well as week, as Mr. Pearce proposes, could not be done without accepting his other drastic and inadmissible proposals.

W. T. L.

PECULIARITIES IN THE STRUCTURE OF SOME HEAVENLY BODIES.

PROF. SUESS has recently contributed a suggestive paper on peculiarities in the structure of some of the heavenly bodies [1] to the Academy of Sciences of Vienna. He remarks at the outset that the present phase of geology is similar to that of anatomy at the time when the structure of the human body was first compared with that of other living organisms. For the purpose of comparative study it is essential that the earth should be regarded as a whole, and when this is done it becomes fairly obvious that acid rocks and their derivatives, which form so large a portion of the visible surface, are far less important as constituents of the globe than might at first sight be supposed. We see but little of those heavy substances to which the earth owes its high density, and which appear to be more closely associated with the basic than with the acid rocks. Our author considers that for the general purpose which he has in view three main types of rock should be recognised—SiAl rocks (sal or salic rocks), SiMg rocks (sima or simic rocks), and NiFe rocks (nife or nific rocks). For the simic rocks containing chromium and iron he uses the term crofesima. The most important occurrences of platinum are in the crofesimic rocks, which also contain almost always traces of nickel. These rocks are of deep-seated origin, and it is a significant fact that they frequently occur as intrusions along planes of movement in the younger mountain chains, such as the Alps, *e.g.* zone of Ivrea.

In 1901 the author, in a letter to Sir Norman Lockyer (NATURE, October 24, 1901, p. 629), directed attention to the fact that the metals associated with the basic rocks are not only distinct from those which often accompany the acid rocks, but that they agree closely with those which stand out prominently in the Fraunhofer spectrum and in α Cygni. This led Sir Norman to institute a special research, with the result [2] that "the views of Prof. Suess were confirmed . . . and that the metals conspicuously represented in the spectra of the sun, the chromosphere, and α Cygni are, in the main, those which are associated with basic rocks; also that, with the possible exception of yttrium and lithium, the metals typical of acid rocks are not represented in α Cygni. There is, of course, evidence that several of the acid-rock-metals such as potassium, beryllium, cerium, tin and zirconium are represented in the Fraunhoferic spectrum, but the solar lines are in each case inconspicuous."

Commenting on the above quotation, Prof. Suess points out that if the composition of the earth be considered quantitatively there is every reason to believe that it would, if subjected to the necessary physical conditions, yield a sun in which the basic group of metals would spectroscopically dominate over the acid group.

In considering the distribution of metals of the basic, or, as he now expresses himself, of the simic group, the author directs attention to the local predominence in terrestrial occurrences of certain metals, *e.g.* titanium over nickel and *vice versâ*. Similarly, if γ Cygni be compared with α Cygni, titanium, strontium, and scandium will be seen to be more important, and iron, chromium, and magnesium less important in the former than in the latter.

The special importance of titanium in sun-spots is compared with the predominance of this metal (ilmenite) over nickel in the contents of the diamond-pipes of South Africa, which are regarded as the most striking terrestrial examples of gaseous eruptions.

In the concluding part of the paper the author briefly reviews the theories as to the origin of meteorites, and favours the view that they, together with the planetoids, represent the fragments of an anonymous planet which formerly occupied a position between Mars and Jupiter. "The centre of this planet," he says, "consisted of nife like that of Agram or Elbogen. Towards the exterior the proportion of magnesium increased, and a transition from nife to sima took place, as is probably the case with the earth, although the supposition cannot be verified by observation. A salic outer crust was absent unless it be represented by the perfectly molten tektites." [1]

[1] "Über Einzelheiten in der Beschaffenheit einiger Himmelskörper" (*Sitz. a. k. Akad. d. Wiss. Mathem-naturw. Klasse*, Bd. cxvi., October, 1907.)

[2] "Spectroscopic Comparison of Metals present in Certain Terrestrial and Celestial Light-sources." (Solar Physics Committee, 1907.)

[1] This term has been proposed by Dr. F. E. Suess ("Die Herkunft der Moldavite und verwandter Gläser," *Jahr. geol. Reichsanst.*, 1900, p. 193) for certain peculiar vitreous bodies which he refers to an extra-terrestrial origin.

SIR JOHN ELIOT, K.C.I.E., F.R.S.

THE news of the death of Sir John Eliot, K.C.I.E., F.R.S., in his sixty-ninth year, at his residence, Bon Porto, Cavalaire, Var, France, will be received with great regret by a very large circle of friends. His death was extremely sudden, and took place in the early morning of Wednesday, March 18. He was walking on a steep hill in his own grounds, superintending the work of his men, when he suddenly sat down and passed away. The cause of death is said to have been apoplexy.

Sir John Eliot was throughout his life a most indefatigable worker, and since his retirement from the Indian Service about five years ago he had continued to work with unabated vigour. Indeed, the strenuous work which he undertook may perhaps have undermined his health, and have caused his premature death. He was one of the most genial companions possible, having a most charming personality, together with a keen sense of humour. He was most widely read and well informed in almost every subject, and at the same time he was one of the most modest of men. He was a most accomplished musician, and played the organ and piano with very great execution and feeling. He was also