

point. This property characterises the other occupants of the eighth column; to some extent in the iron group, and certainly in the palladium and platinum groups.

(5) The introduction of a new element with the atomic weight of 20 (not 21 or 22), will extend the range of certain recurring numbers which appear near the beginning of the series of atomic weights. In the existing arrangement of the atomic weights it will be observed that between oxygen 16 and fluorine 19 there are three units; between fluorine 19 and sodium 23 there are four; then the numbers run 1, 3, 1, 3, 1, 3. Adding argon at 20 the series becomes symmetrical all the way from oxygen to chlorine, as will be seen in the diagram on the previous page.

If, on the other hand, we were to adopt 40 as the atomic weight of argon, we should meet with the following serious difficulties:—

(1) There is no room for it. To place another figure just before or just after calcium would disarrange the whole subsequent series.

(2) It would break the periodic law in regard to its melting point.

(3) It would break the law in regard to its atomic volume.

(4) The inactive argon would be associated with metals of the earths, the compounds of which are remarkably stable.

(5) It would bring the atomic weight of three elements, potassium 39, calcium and argon each about 39.9, within one unit. This never occurs elsewhere in Mendeleëff's table.

Against these considerations there is the forcible argument deduced from the ratio of the specific heats of argon. I will not attempt to weigh the respective merits of these lines of reasoning, especially in the absence of the details of the experiments on the velocity of sound, and until we have some knowledge of the compounds of argon. Trustworthy conclusions will not be possible till this further information is obtained. It is not a question of physics *versus* chemistry, for the true theory of its place among the elements must be able to coordinate all the facts upon which both the chemist and the physicist rely.

J. H. GLADSTONE.

London, February 8.

#### The Aurora of November 23, 1894.

PERMIT me to call attention to a significant fact disclosed by a scrutiny of the observations of the aurora of November 23, 1894, and having an important bearing in discussing the auroral dimensions, and which appears to have escaped notice (see NATURE, January 10). I refer to the *invisibility* of the objects at Dingwall, to the observers at Tynron, Dumfriesshire. Extracts from the synchronous accounts in NATURE, November 29, p. 107, and January 10, p. 246, will prove this statement.

*Tynron*, 7.30.—Luminous mist in the northern sky, strong enough to cast shadows on the shining surface of the wet ground. The mist moved from the horizon to the zenith, forming a detached luminous belt in patches, disappearing at 8.30, leaving only the light in the north.

*Dingwall*, 7.30.—Sky covered in all directions by a canopy of streamers. At the same time the arch disappeared, and occasional streamers up to eight o'clock. It is not possible that the arch seen at Dingwall could be the same as the one at Tynron, because the former had vanished when the latter commenced to form, whilst there is a total absence of streamers, and phenomenally brilliant mist not recognised at the other place. Until methods of observation and analysis can be introduced that will eliminate the errors of identification, the solution is likely to be indefinitely postponed.

W. H. WOOD.

Birmingham, February 3.

MAKING the necessary allowances for increased apparent luminosities of bright streaks, or of layers of light in the atmosphere, by the foreshortening effects of end-on, and of edge-presentations, the observations at Dingwall and in Dumfriesshire of the aurora of November 23 last, scarcely seem to recount very much which was not at the two places, at least partially, a fairly comparable and nearly contemporaneous description of the same phenomena. The first-formed light-band of the glow was very strong at Dingwall from the east to west, a little southward from the zenith, until 7.30 p.m., when with the usual drift of such displays to southwards, it became less prominent there than the approaching canopy of streamers

which supervened, drifting up from the north-eastern sky in rear of it. But it assumed at the same time increasing prominence in Dumfriesshire (150 miles south of Dingwall), where between 7.30 p.m. and 8 p.m., it passed overhead in the shape of detached patches of light, a form which the belt was also seen to assume and to break up into, in a slow extinction stage at Slough, in that interval. The display of streamers rising from a large tract of light-mist approaching Dingwall from the northward and increasing constantly in lustre at 7.30 p.m., did not extend far south of Dingwall before it faded out soon afterwards; and being (as it was seen at Slough) a dense local discharge of them, its corona of brightly-foreshortened beams overhead would naturally be a very impressive sight at Dingwall, although from a position 150 miles distant in Dumfriesshire, the broad-side aspect of the short outbreak, seen from afar, instead of from underneath, would only have the appearance of a sheaf of coloured light projected up from the usual flat streamer-base, neither very wide nor extraordinarily lofty, but of the massive berg-like form, which was its description at Slough, not unfrequently noticeable in rather strong auroras; and it may even have been quite easily hidden from view entirely at Tynron, although a clear horizon in the north near Slough allowed its observation there, by trees or by other obstructions in the landscape.

If Mr. Wood can happily devise a practical means of perfectly recording the times and descriptions of *all* the rapidly changing features of an aurora, and the shifting variations of its misty light-glows, he could no doubt achieve results from observations which would be no less a benefit to astronomers and terrestrial magneticians, than an exact continuous registration of cloud phenomena would be of welcome interest to meteorologists and terrestrial electricians; but it needs no great familiarity with auroral exhibitions to be quite certainly assured that results of records even so elaborate as those might be, would never be found to confute, but only to confirm the generally accepted view of the really cosmical heights and dimensions of all truly auroral lights and coruscations; of all such lights, that is to say, as show in their spectra the yellowish auroral line, or some of the other well-recognised spectral indices of the aurora.

A. S. HERSCHEL.

#### The American Association.

AT the Brooklyn meeting of the American Association for the Advancement of Science last summer, it was decided to meet this year at San Francisco, provided reasonable rates of fare could be secured from the trans-continental routes, as it was supposed could be done. Prof. Joseph Le Conte for three consecutive years had crossed the continent, laden with earnest and cordial invitations from the Universities and Scientific Societies of California, and the Common Council of San Francisco, to hold the meeting for 1895 in that city. The short-sighted policy of the railroads, however, refused to grant any concessions; and it has at last been decided to meet at Springfield, Mass., August 29—September 4. The meetings of affiliated societies will begin on Monday, August 26—rather later than the usual time of meeting.

Springfield is a small city, located in the heart of New England. It is the seat of the principal arsenal of the United States; and, while not a University city itself, it is within two or three hours' ride of nearly, or quite, a score of institutions of learning of the highest grade, including the two oldest and most powerful Universities in America, Yale and Harvard. This will be the second meeting at Springfield, the first having been held in 1859.

The Association is incorporated by the State of Massachusetts, and its office and museum are at Salem in that State; but no meeting has been held in New England since that at Boston in 1880, the most brilliant in all the history of the Association. The return to New England after this longest absence, gives unusual interest to the approaching meeting.

WM. H. HALE.

Brooklyn, New York, February 2.

#### Earthquake in Norway.

ABOUT midnight on the 4th and 5th of this month, a fairly strong earthquake occurred in the southern part of Norway. The greatest disturbance was felt in the environs of the town of Aalesund, upon the west coast (about 60° 30' lat. N.). From there