

of mountains is calculated, and to which barometrical readings are reduced.

This assumption, however, is called in question by several mathematicians, who allege that the sea-level is by no means that of a regular spheroid, as is generally supposed, but may vary many hundreds of feet in level even along the same parallel of latitude, quite independently of the temporary action of winds or of ocean currents.

According to the law of gravitation, all substances attract one another with a force proportional to their masses. A continent of land will therefore exert an attractive influence upon the sea, and cause it to rise upon its shores to a height which will vary according to the mass of land that causes the attraction, and may amount, it is said, to as much as 1000 metres above the level to which the sea attains in mid-ocean. This extraordinary result is deduced by Ph. Fischer from a discussion of pendulum-observations, and somewhat similar conclusions are arrived at by Listing and Heinrich Bruns.

Founding upon these observations, a German geologist, Dr. Penck, has proposed an explanation of the phenomena presented by the raised beaches, and other tokens of oscillation in the sea-level, which are so conspicuous during the glacial period. If the land has the property of thus drawing the sea towards it in proportion to its mass, it follows that anything which adds to that mass will increase the effect, and thus a great thickness of glacier-ice laid upon a continent, will draw the water towards it, and raise the sea-level in its immediate vicinity; and, according as the ice increases or diminishes, so will the level of the sea rise or fall in proportion. Moreover, the altitude of the sea-beach may vary considerably, it is said, along the border of one and the same continent, by reason of the varying thickness of the ice in different parts. In this way it is conceived an explanation is found for the fact that in Norway the old terraces and sea-beaches do not coincide in level, but vary in altitude at places not very far distant from one another. The action of the ice may in short be so localised that its attractive force will vary considerably along the same line of coast.

These views are certainly somewhat different from those that have hitherto prevailed in regard to the regularity of the sea-level. If there is such a very great difference in the height to which the surface of the sea may attain in different places, the barometer should give more indication of it than it seems to do. Nevertheless, it is to be desired that every means should be taken to ascertain the relative height of the sea in various places so chosen as to test the truth of the views I have mentioned. The apparent connection between glaciation and submergence is now attracting notice in various quarters. Dr. Penck maintains that shifts in the relative level of sea and land go hand in hand with oscillations in the glaciation. In 1865 I called attention to this connection, and suggested what seemed to me to be a possible explanation of it (see *Journ.* of the Geol. Soc. vol. xxi. p. 178).

Penck's views, it will be seen, are somewhat different from those of Adhemar and Croll, to which he points out several objections. His memoir is entitled "Schwankungen des Meeresspiegels," and appears in the *Fahrbuch der Geograph. Gesellschaft zu München*, Bd. vii. 1882.

T. F. JAMIESON

Ellon, Aberdeenshire, July 31

#### Voice in Lizards

THE above heading in NATURE, vol. xxvi. p. 29, rather surprises me, as though voices in lizards were a recent discovery. The loud and plaintive "gui—gui—gui" made by the large land lizard of that name, has been well known to me for the last seventeen years, and is of course well known to every Assamese. The call is always heard in twilight, in the depths of the forest, and when once heard is not mistakable for that of any other animal. It is plain, monotonous, loud, and repeated with two second intervals some eight or ten times, when there is a pause of about two minutes, and it is repeated. For those who do not understand the Hunterian system of spelling I would write it gooee—gooee, the oo most prolonged. The gui is about 3 to 3½ feet long—from snout to tip of tail—which latter exceeds the body and head. Colour grey-green, with clear yellow scales here and there—at times grouped—and that gives a mottled appearance. The tail has a double row of sharp scale-pines along its crest, and if suddenly lashed can cut the skin of any bare-legged bystanders.

It lives in holes under, or in, tree stems, often as high up as 30 or 40 feet. The flesh is eaten and prized, the skin used as the membrane in some kinds of guitars. There seem several kinds, one of 3 or 3½ feet, another larger—both land lizards—a still larger kind frequents the rivers, up to 6 feet or more in length. It hisses like the larger snakes, and the peculiar call that gives it the name "gui," can be heard in still forest I should say a mile; one that repeats this monotonous call every evening is loud enough to be an annoyance at times, though it is over 500 yards off.

Sibsagar, Assam

S. E. PEAL

#### Halo

ABOUT 2 p.m. to-day a remarkable halo was visible here. The sky was partially covered with light cirrus clouds, and some small fleecy drift was rapidly moving from the north-west at a low altitude. I saw a bright bow at about 45° from the sun nearly due north, extending over a clear portion of the sky; this gradually extended till it formed a circle with the sun in the most southern point of its circumference. The width of the bow was rather greater than the diameter of the sun, the whole circle being, as near as I could judge, 45° or 50° in diameter. It was brilliantly white, brighter than the white of any clouds in the neighbourhood; it lasted perhaps fifteen minutes, and gradually broke up and faded. I could see no other interesting halo nor any appearance of parhelia.

W. A. SANFORD

Tynehead, Somerset, July 25

#### THE ELECTRIC PROPERTIES OF FLAMES

THE electric properties of flames have often invited the investigation of physicists, but the obscurity and contradictory nature of some of the phenomena have been such that in spite of a large number of researches no complete account of these properties has hitherto been given. Most of these researches are enumerated in a paper contributed by Prof. Holtz to Carl's Repertorium last year; but though Holtz has himself added to our knowledge of the electrical property of flames by his researches on the behaviour of flames when employed as electrodes, he left much yet to be investigated in this department.

The latest contribution to our knowledge of the subject appears in the current volume of Wiedemann's *Annalen der Physik und Chemie*, from the joint pens of Herren Dr. Julius Elster and Hans Geitel. As the results of their investigations go far to clear up some of the points which have hitherto been obscure or contradictory, some account of these investigations will probably not be unacceptable to the readers of NATURE.

The chief theories that have been advanced from time to time in explanation of the electrical properties of flames may be reckoned as three in number.

1. Pouillet in 1827 propounded the suggestion that the electricity of flame is due to the process of combustion as such, and therefore presumably analogous to the electrification observed by Volta to result when a burning coal or pastille is placed upon the cap of an electroscope.

2. Matteucci, in 1854, explained the phenomena by supposing that the flame acted upon the two metal electrodes (employed to test its electrification) as an electrolyte; in fact, that it acted as the acid between the two metallic plates of a voltaic cell; a view which practically agrees with that earlier propounded by Hankel.

3. Buff suggested that the explanation was to be sought in a thermo-electric difference between the two electrodes.

Sir William (Mr. Justice) Grove had shown moreover that when a platinum wire is bent so that one end of it stands in the tip of a flame, while the other is immersed in the flame near its base, a current of electricity is set up in the wire. This phenomenon might at first sight be thought to agree with an observation of Hankel, that a flame is "polarised" longitudinally; that is to say, Hankel found there is a difference of potential between the tip and the base of a flame, and this difference of poten-