LETTERS TO THE EDITOR.

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Sunset Glows at Honolulu.

THERE has just been at Honolulu a reappearance of the phenomenon of sunset glows like those so familiar in 1883-84. It was first noticed after sundown of July 13. It seemed somewhat brighter on the 14th and 15th. After this it declined in intensity, but could be distinguished until the 20th.

A space of 15° radius around the sun was occupied by a whitish glow like that in "Bishop's ring." The outer coloured ring seemed to be entirely wanting.

We have no cable, and no foreign mail has arrived since the 6th. By a mail due to-morrow, we hope to hear of a probable cause to which this remarkable appearance may be due.

I note the following differences between these sunset glows and those of 1883-84. These are very much less bright than those; possibly equal to what those became after one year's continuance. Perhaps the most notable difference is the appearance of a tertiary glow after the primary and secondary. This consisted of a delicate rosy flush occupying a large tract of sky above the western horizon, from the altitude of 10° to that of 45° , and about 60° horizontally. This shaded off into purple at the edges against our clear blue Hawaiian sky. I think this the most exquisite and lovely tint I have ever seen in the sky, comparable only to that of some perfect jewel.

The larger stars were visible at the time of this tertiary glow. It continued for only a very few minutes each evening. A faint purple tint extended along the horizon quite to the south. This third glow failed to gather down upon the horizon like those preceding it.

Another marked peculiarity is the much earlier time at which the primary and secondary take place. The primary glow gathers soon after the sun is down, and makes its display while the sky is still bright. So it fails to be very effective as a show, although casting upon the western sky broad streaming radiations of glowing surface.

The secondary glow promptly follows and makes the chief display. It differs from the secondary Krakatō glow in the earlier time when it takes place, being nearly finished before any stars are visible. The Krakatō secondary lingered until after full darkness, settling down into a low blood-red stratum simulating the reflection of a remote conflagration. That peculiar simulation was entirely absent from the late appearances. Both at its close and throughout its course this secondary glow substantially resembles the primary glows as seen in 1884. It especially resembles the latter in presenting a well-defined and serrated upper edge bordered by dark sky. That, however, had small and numerous serrations, apparently due to cumuli upon a very remote horizon. The serrations of this, on the contrary, are large and broad, the interspaces being apparently the inverted shadows of cloud-masses upon a somewhat near horizon.

It seems evident that the reflecting stratum of haze in the late appearances was very low down as compared with the Krakatō haze. Hence the rapid succession of the glows. The reflected rays of the sun, traversing a much smaller extent of the lower atmosphere, show less red, having less of the other colours intercepted. For the same reason, they retain force enough for a third reflection, in which a very pure though faint red appears.

Honolulu, July 25.

SERENA E. BISHOP.

Globular Lightning.

THE following account of a display of globular lightning will, I think, be of interest to your readers, as it was well observed by several independent observers, and differs in some respects from those previously recorded. It is greatly to be wished that this phenomenon could have its place assigned to it in electrical theory.

On Monday, the 5th instant, at midday, this district was visited by a violent storm of rain, which lasted half an hour, and was accompanied by thunder and lightning. When the storm had passed over and the sky was getting bright, a rod-like object was seen to descend from the sky. It is described as being of a pale yellow colour, like hot iron, and apparently about 15 inches

long by 5 inches across. These dimensions are given by an observer who estimated its distance (about correctly, as it subsequently appeared) at 100 yards, and are not therefore affected by the uncertainty attaching to estimates of the sizes of objects whose distance is quite unknown. This object descended "moderately slowly," "not too fast to be followed by the eye" and quite vertically.

On reaching a point about 40 feet from the ground, and in close proximity with a chimney-stack belonging to a house in Twickenham Park, the object seemed to "flash out horizontally as if it burst," showing an intensely white light in the centre and a rosy red towards the outer parts. At the same instant a violent explosion was heard, and soon afterwards a strong smell was perceived, which is described by the observers as "resembling that of burning sulphur," for which the smell of ozone and nitric oxide might easily be mistaken.

Ordinary lightning is frequently most capricious in its action. In this respect this globular flash was in nowise behind.

I examined the outside of the chimney stack carefully, but no external effect whatever was visible. Inside, however, remarkable effects were produced, and I quote the following:—

"The back rooms consist of (1) basement kitchen; (2) ground floor dining-room; (3) first and second floor bed-rooms, and at the top a half attic. A stack of chimneys runs up the whole, and projects about 6 feet above the roof. There are no chimney-pots. No one was in any of the rooms except the kitchen, in which the servants were, and in which a fire was burning.

"The explosion filled the kitchen with smoke and soot. The dining-room also was filled with smoke and soot, though no fire was burning in it.

"The master of the house was just coming into the dining-room from the conservatory when he heard the detonation and simultaneously saw a bright flash of light. He staggered back a moment, and then ran through the smoke and soot to the hall, and called out to know if anyone was hurt. Finding all safe he returned into the dining-room. A Japanese umbrella set open as an ornament in the empty grate, but not fixed in any way, was undisturbed, though the hub of it was hot to the touch. Piles of soot spread out in a semicircle to the centres of the side walls of the room, and an arm-chair, which had been standing close to the fire-place, was 6 feet from its previous position, and had evidently been turned round and thrust against the wall. In the bed-room, on the first floor, soot was on the floor and in the fire-place. The slab of marble forming the architrave under the mantel-shelf, and extending the whole width of the fire-place, had been thrust out from its setting, and was, with a number of bricks, lying 6 feet away on the floor. The mantel-shelf and pier-glass were undisturbed. In the second-floor bed-room, soot and mortar were in the fire-place and on the floor; one end of the grate was broken and a piece of the detached cast iron (some 3 inches square) was lying against the wall 6 feet to the right. In the attic bed-room, mortar reduced to the condition of fine silver sand was lying in the fire-place and on the floor; the wash-stand, which stood against the fire-place, was pushed some 2 or 3 feet towards the centre of the room, but not overturned; and the carpet was rumpled up. There is in this room a bell on the wall opposite the fire-place, and a helical check-spring passes from this bell to an attachment in the wall. At this point of attachment a piece of plaster of the size of one's hand had been detached from the wall, and was found near the fire-place, 18 feet off at the other end of the room."

At this time, when electrical theory is receiving so much attention, the views of a theorist such as Dr. Lodge would, I think, be of great interest on the subject of these rare discharges. To all appearance a detached portion of something—is it atmospheric, or ethereal?—is carried along bodily through the air, bearing with it a very considerable potential energy, and at the same time radiating light. At an instant determined, perhaps, by its proximity to the chimney-stack, its constraint is suddenly relieved, and a discharge like ordinary lightning seems to occur between it and the earth, *vid* (as it seems) the heated air of the chimney. Has anyone an explanation for this?

A. T. HARE.

Neston Lodge, East Twickenham, August 24.

On some Effects of Lightning.

I CAN fully corroborate Mr. A. F. Griffith's account of the remarkable way in which two trees in a wood near St. Albans