It is almost certain that the effect is a combined Mercury-Venus-Earth effect, but it looks as if the Venus effect on the Sun was equivalent to a quarter diurnal tide, if it is tidal.

The data shows that between the two years 1910 and 1920 the longitude of Venus changed approximately 90°; and on the dates in question Mercury approximately changed his longitude, between the two years, by 180°; the Earth, of course, changing his position 90° approximately in three months. The synodic period of Mercury is about three months, so that even a direct action of Mercury on terrestrial magnetization would have a three-months periodicity, but that could not account for equality of range at epochs ten years apart. Lamont's period of about 10·3 years in the diurnal range of declination in the Northern Hemisphere is no doubt connected with the above effect.

Note on the Annual March of Magnetic Horizontal Force.

In the course of investigations it was found that the average annual march of H.F. for the four years 1902 to 1905, applied as a correction to the graph of H.F. means over those years, yielded almost exactly similar curves for sixteen months, about the 17th January, 1905, as did the average for the eight years 1913 to 1920 about the 15th August, 1919. The effect was too exact to be due to any accidental cause, and the remaining variation was of a very pronounced nature. The effect, too, persisted too long to be mistaken about. It was therefore desirable to note the positions of the planets about those dates, and particularly to see if there was not some systematic difference in their heliocentric longitudes on the two occasions. Some success was immediately evident. It seems to me that the effects in latitude 45° on the Earth more simply correspond with the phenomena of the solar system than those elsewhere.

Corrected H.F. Ch.ch.
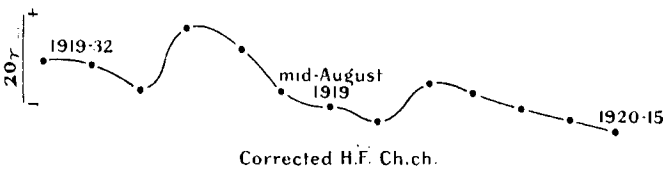
Heliocentric Longitudes of the Planets at 1904·0 and 1917·0 (the Mid-epochs of Years 1902 to 1905 and 1913 to 1920.)

				1904·0.	1917·0.					1904·0.	1917·0.
☿	..	..	..	19° 13′	12° 18′	♃	..	..	..	358° 27′	36° 40′
♀	..	..	..	163° 57′	213° 03′	♄	..	..	..	310° 45′	116° 32′
⊕	..	..	..	99° 40′	100° 32′	♅	..	..	..	265° 59′	319° 20′
♂	..	..	..	340° 30′	302° 57′	♆	..	..	..	94° 34′	123° 20′

Mercury was at both epochs close to the longitude of the perihelion of Jupiter, with Jupiter near in longitude, approximately as much behind Mercury at 1904·0 as he was ahead at 1917·0.

Heliocentric Longitudes of the Planets at the Times of Greatest Similarity of Corrected Marches of H.F. at Christchurch.

						Jan. 17, 1905.	Aug. 15, 1919.	Approx. Heliocentric Long. Perihelion.
☿	..	..	..	..	..	184° 01′	321° 27′	75°±
♀	..	..	..	..	..	54° 51′	303° 56′	129°
⊕	..	..	..	..	..	116° 44′	321° 36′	100°
♂	..	..	..	..	..	175° 00′	98° 27′	333°
♃	..	..	..	..	..	33° 25′	119° 20′	12°
♄	..	..	..	..	..	322° 39′	151° 20′	90°
♅	..	..	..	..	..	270° 26′	329° 36′	171°
♆	..	..	..	..	..	96° 54′	129° 08′	46°±

The heliocentric longitude of the perihelion of Venus is approximately 129°. It is seen that on the 17th January, 1905, the actual longitude of Mercury and Venus differ by 129°, and Venus is behind her perihelion longitude by the longitude of the perihelion of Mercury. On the 15th August, 1919, the actual longitudes of the Earth and Mercury are the same, 321°—that is, they are behind the longitude of the Earth's node by 129°-90°, or the difference of the heliocentric longitudes of the perihelia of Venus and Saturn.

There is very little doubt that both the march of H.F. and the range of the diurnal inequality of H.F. depend upon the longitude of the planets and their perihelia, and that the effect is conveyed to the Earth in some way by the solar action.

Furthermore, in a diagram given below there are plotted the directions of the nearest planets as seen from the Sun with respect to the direction Sun to Venus on the 30th June, in the years 1914 and 1919. It was found that at Christchurch the marches of H. in the two years were complementary for nearly ten months about the mid-year.