

The data for the even members of the normal fatty esters are given in Table II. D represents the initial molecular depression for a fall of 0.5° .

TABLE II.

N.	Ester.	D.
2	Ethyl acetate	75
4	Ethyl butyrate	79
6	Ethyl hexoate	98
8	Ethyl octoate	—
10	Ethyl decoate	81
12	Ethyl laurate	79
14	Ethyl myristate	81
16	Ethyl palmitate	88
18	Ethyl stearate	82

The values of D are plotted against N (the number of atoms in the acid portion of the molecule) in fig. 2. The resulting curve shows a minimum and two distinct maxima.

According to Baeyer's tension theory a chain of six carbon atoms bends round to form a ring in space. But, as shown above, there is a considerable tendency for the formation of maxima or minima in the case of compounds with a chain of six and twelve carbon atoms. Hence it appears that association, which has been shown to cause the appearance of a maximum or minimum, is largely influenced by the arrangement of the atoms in space. Further, the regular rise and fall in the properties of the esters of the fatty acids can be explained on the assumption of Baeyer's hypothesis of the configuration of a chain of carbon atoms in space.

ART. LXII.—*A Flash of Lightning.*

By Archdeacon WALSH.

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ABOUT last February a thunderstorm passed over the district of Taiamai, a tract of volcanic country lying about half-way between the Bay of Islands and Hokianga. The discharges were not very frequent, but were unusually heavy. One of them fell in a fairly level paddock close to the coach-road from Ohaeawai to Kaikohe, about half a mile from the former place. A wagon drawn by a team of horses was passing at the time, when the horses, terrified by the blinding flash, bolted, and the wagon was upset. It was raining in torrents, and a couple of Maoris, who were standing under the verandah of a cottage some three or four hundred yards off, stated that the

water appeared to bubble on the ground, and that steam kept rising for half an hour from the spot that had been struck.

The phenomenon was plainly visible from the Township of Ohaeawai, and an animated discussion arose among some of the inhabitants as to its origin and results. By a too hasty generalisation the "thunderbolt"—as they agreed to call the electric discharge—was confused with the fall of a meteorite, and an individual who claimed to have some knowledge of the subject informed them that if the celestial visitor could be secured it would prove of considerable commercial value. He estimated that it would be worth at least £20, whether regarded merely as a curio or as a mass of marketable metal.

Their scientific curiosity whetted by the hope of a financial return, a party of young men set out on a search expedition. They had no difficulty in finding the spot, and on arrival discovered a circular hole in the ground about 4 in. in diameter, surrounded by a number of similar perforations on a smaller scale, the whole set occupying a space of perhaps 2 or 3 yards square. It was evident that the discharge had split off into several branches on approaching the ground. It was not explained how twenty pounds' worth of meteoric iron could have forced its way through so narrow a passage; but, nevertheless, they started to dig. Failing, however, to bottom the hole at the depth of 6 ft., they sounded with a piece of fencing-wire, and as this went down for another 14 ft. the sinking was regretfully abandoned.

Taking an early opportunity to visit the scene of operations, I found that the excavation had been filled up, and as the ground had been so trampled by the explorers all trace of the smaller holes had disappeared. I should like to have been able to examine the hole. There is no doubt that it was caused by the lateral expansion of the steam generated in the wet ground by the intense heat of the electric discharge. It is well known that on the passage of a lightning-spark through a bed of sand a tube of vitreous matter called a "fulgurite" is sometimes formed by the fusion of the particles of silica. Possibly some similar formation would take place in a stratum of clay; but in the volcanic ground of Taiamai, already subject to the extreme action of fire, it is unlikely that further metamorphosis could take place, and any change in the structure would be only due to compression. It would have been interesting, however, to see whether the compression had been sufficient to form a definite tube.