

publications that the internal anatomy of the lac insect had been studied by me; Prof. Bugnion then at Lausanne an authority on wax glands; Prof. Silvestri of Portici who was proposing to write a monograph on lac insects; Prof. Ferris of Stanford, California, who was equally interested in lac insects, and Dr. Imms then at Rothamsted. The Director of Industries, Hyderabad, also received a copy and another was deposited at the Indian Institute of Science, Department of Applied Chemistry. Under the post-war economic conditions, even in Germany then, an accepted thesis did not receive greater publicity than had been the fate with my work.

My histological paper entitled "Seats of the Origin of Lac Products" recognised stick lac as a concrete where besides lac, several kinds of wax form an inner structure. I had attempted to show the glands responsible for the secretion of each of these products. In a later publication<sup>6</sup> several indications have been made to previous histological findings, *viz.*, "Throughout the undersurface of the skin there are dermal glands. They have long chitinous ducts and with these they look like toy balloons." Prof. Misra<sup>7</sup> in criticising all previous workers generally and Chamberlin particularly says that they "do not mention the presence of any glandular structure associated with these pores". In his historical introduction he entirely ignores the histological findings casually mentioned in my paper of 1923 which he, however, critically refers to in another connection in the same paper. Misra claims "the lac glands are being described and figured here for the first time". I assert that Misra was not the first to have seen these glands; at any rate, he has not given a more exhaustive description than that contained in the very short passage quoted above from me. His illustration of ducts shows them to be wavy and the glandular structures, therefore, resemble spermatozoa. The ducts are of hard chitin and hence they possess a rigidity similar to a wire. I am not interested here in criticising his results but in pointing out that he has ignored my previous findings. In my publication, I have repeatedly emphasised the presence of hard and soft waxes in stick lac.

<sup>6</sup> Mahdihassan, *J. Sci. Assoc., Vizianagaram*, 1923, 1, No. 2, 86.

<sup>7</sup> Misra, *Proc. Zool. Soc., London*, 1931.

A histologist would have found wax glands instead of "special lac glands" as named by Misra which is misleading, as it only lends to the assumption that stick lac is a homogeneous substance. Misra's publication is a result of academic work and it is surprising that there should have been other glaring omissions in acknowledging previous work. It may be particularly pointed out that Fig. 1 (B) and Fig. 3 both on Pl. 1 of Prof. Misra's<sup>7</sup> paper, are similar to those already published by Rai Bahadur Misra<sup>8</sup> and by Chamberlin<sup>9</sup> respectively.

It is hoped that in future such plagiarisms will be avoided; that unhealthy rivalry and duplication will be discouraged; and that scientific workers will develop a spirit of genuine research with a sense of responsibility.

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July 24, 1934.

#### Influence of Moon on Earthquakes.

It is well known that the shape and position of the continents with their high mountains and seas, owe their origin to the great upheavals that have taken place millions of years ago and that are still going on in a moderate scale within the crust of the earth. Some think that the forces which have caused these changes are due to cooling of the earth's crust, while others think that they are due to polar movements caused by the rotation of the earth. Whatever might be the cause, these great upheavals have brought about regions of instability within the crust of the earth, and whenever there is a fresh dislocation due to tectonic movements mentioned above, an earthquake occurs. It is supposed that astronomical bodies, such as Sun and Moon, have no influence in precipitating a quake. It seems, however, that though the astronomical bodies are incapable of precipitating a dislocation, yet they are able to magnify the movement if they can exert their maximum influence during a dislocation.

If the forces due to Moon and Sun act in the direction in which the dislocation of the crust occurs, then obviously the displacement will be greatly magnified, and would

<sup>8</sup> Rai Bahadur Misra, *Pusa Bull.*, 1923, No. 142, 10, Fig. 2.

<sup>9</sup> Chamberlin, *Bull. Ent. Res.*, 1923, 14, Pt. 2, Pl. X, Fig. D.

set a devastating earthquake. One is therefore led to suppose that when a quake occurs under such conditions it must spread over a large area and produce great destruction of life and property. It is significant that during the undermentioned Earthquakes viz.—

(1) Assam quake (1897) 4-25 p.m., 12th June;

(2) North Bihar quake (1934) 2-25 p.m., 15th January;

(3) Kangra quake (1905) 6 a.m., 4th April;

the positions of the Moon were as follows:—

- (1) Moon away from the Sun by about 150° east, i.e., anti-Moon 30° west of Sun.
- (2) New Moon.
- (3) New Moon.

If we examine Figs. 1 to 3 we see that

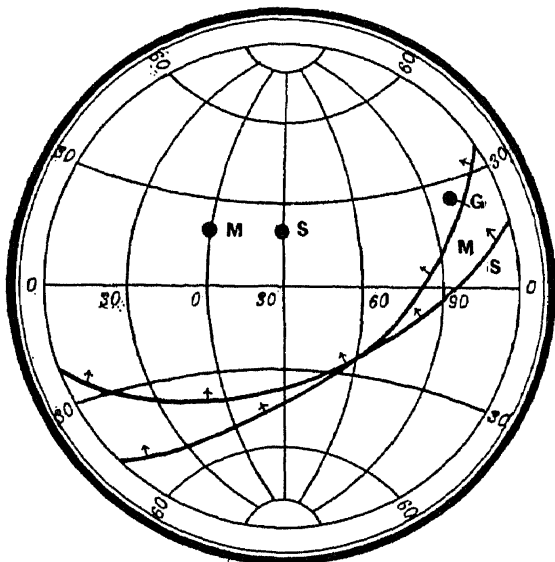


Fig. 1.

Assam Quake.

4-25 p.m., 12th June 1897, Near New Moon.

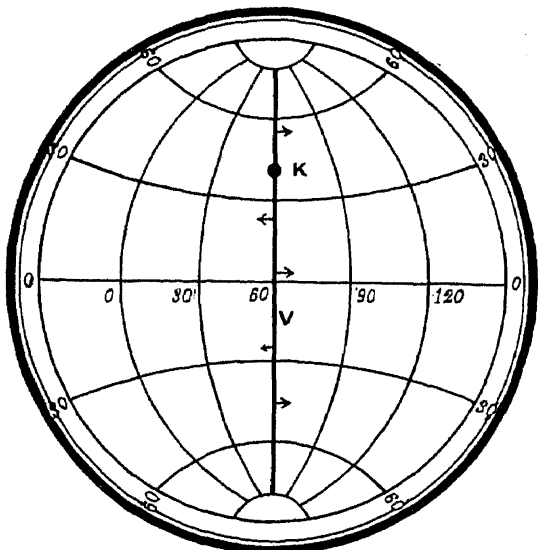


Fig. 2.

Kangra Quake.

6 a.m., 4th April 1905, New Moon.

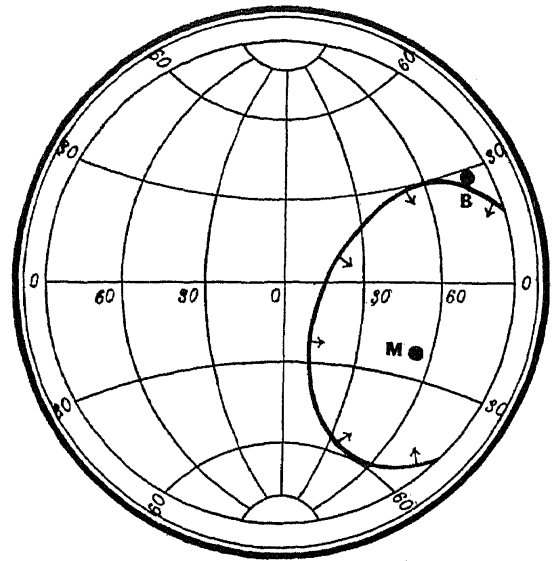


Fig. 3.

North Bihar Quake.

2-15 p.m., 15th January 1934, New Moon.

during Assam quake and Kangra quake the vertical tide producing forces influenced the epicentral tract, while in North Bihar quake, the horizontal forces passed through the earthquake area.

Regarding these forces R. D. Oldham wrote long ago:—“With all these objections there remains a sufficiently strong case for the reality of the influence of these forces in determining the time and origin of earthquakes to justify a fuller investigation.” It is considered that a fuller investigation of all the devastating quakes might lead to the establishment of a definite law regarding the magnifying influence of the forces due to Moon.

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Fruit and Seed Development in *Tinospora cordifolia* Miers without Fertilisation and Embryo Formation inside.

As the internal morphology of the ovule in the family Menispermaceæ is not much known, during the years 1932 and 1933, the undersigned fixed for investigation a large amount of material of *Tinospora cordifolia* Miers from plants growing in the local botanical garden. This included a large number of fruits in different stages of development, beginning with the carpels of flowers that had just withered and ending with the mature red drupes, and was meant for the study of embryogeny in the species.