

## ON THE LAWS OF PESTILENCE.

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[Read December 4th, 1865.]

## ABSTRACT.

1. EPIDEMIC visitations recur at regular intervals of time, of which eighteen and a-half years may be taken as the type. This regular and stated interval is liable to a little variation both on the one side and the other; but a period varying from seventeen to twenty years will embrace all possible deviations.

2. The length of the interval between successive periodic visitations of epidemic diseases corresponds with the period of a single revolution of the line of the lunar nodes, and a double revolution of the lunar apse line.

3. The revolution of the lunar node and apse line involving a material difference of relation, or rather relative position, of the moon to the earth's equator, must exercise a very sensible influence on the tenuity of the earth's atmosphere.

4. It is considered that the difference of tenuity must render the atmosphere at certain times more susceptible to the propagation, if not also to the origination, of the epidemic poison.

5. The influence of the revolution of the lunar node and apse line upon the physical condition of the earth's atmosphere has never yet been demonstrated by astronomers and meteorologists, although there can be no doubt whatever of its existence. M. Arago considers that its effects will be quite the opposite to that of gravity.

6. This influence is more visible by its indirect than its direct effects; by its medical than by its physical consequences; in the same way as the cause of the secular acceleration of the moon was discovered by the indirect effect produced upon the earth's radius by the planetary masses.

7. A double revolution of the lunar apse line and a single revolution of the lunar node, occupy very nearly the same period of time, namely eighteen and a-half years; so that,

at the expiration of that period, the lunar mass occupies exactly the same relative position to the earth's equator which it did at the commencement of it.

8. The revolution of the lunar node causes a difference in the moon's declination of no less a quantity than thirty degrees and thirty minutes during the period of eighteen years and a-half.

9. But since the earth's equator is inclined twenty-three degrees and thirty minutes to the ecliptic, and since the moon's orbit is also inclined five degrees thirty minutes to the ecliptic, the moon's orbit must, in certain positions of her nodes, be inclined about twenty-nine degrees to the earth's equator, and in other positions eighteen degrees, and during eighteen years, the time in which her nodes perform a complete revolution, the plane of her orbit will have every possible position between eighteen and twenty-nine degrees (*Ferguson*).

10. In epidemic visitations depending upon lunar influence (for there are other sources of epidemic diseases, local and partial), the longitude of the lunar node is always a small number, understanding by a small number anything under one hundred and eighty degrees, or six signs of the zodiac.

11. Epidemic visitations possess regular periods of invasion, increment, acmé, and decline.

12. This would proceed from whatever cause they may originate; but the regularity of the progressive increase appears to me to agree better with an exact physical than with a variable moral or social cause.

13. The simultaneous appearances of epidemic disease in several places of the earth's surface, its continuous and progressive march in a somewhat straightforward direction, shew that it owes its origin to cosmical, and not to local, causes.

14. The simultaneous appearance of epidemic and epizootic diseases, referred to by authors on the subject of epidemic diseases, likewise prove the existence of some great cosmical cause, as distinguished from the more ordinary sources of diseases, namely contagion, malaria, the influence of heat and cold, and all other such causes of disease.

15. The simultaneous outbreak of an epizootic and an epidemic is well illustrated by the present epidemic visitation of 1865.

16. It is considered that the influence exercised by the moon on the earth's atmosphere will extend as far as thirty degrees beyond her own actual declination; that is to say,

to sixty degrees north and south of the equator, and these are what may be styled *epidemic limits*.

17. This cause will operate most powerfully within the compass of the moon's actual limits in the heavens north and south of the equator; that is to say, that the moon's influence in producing a state of the atmosphere most favourable to the propagation of epidemic disease, will operate most powerfully within a space of the earth's surface comprised between thirty degrees north, and thirty degrees south of the equator.

18. Accordingly we uniformly find that epidemic diseases originate within the limits last referred to.

19. It is a most important point to remember that it is only a limited number of the whole community which is liable to the malignant and deleterious influence of the epidemic poison, or *loimaitia*.

20. The period intervening between two successive visitations of epidemic disease may be called the *epidemic intervals*; the duration of the epidemic visitation may be called the *epidemic phase*; the material cause of the visitation the *epidemic poison, or loimaitia*; and the basin of the Mediterranean the *epidemic focus*.

21. Epidemic visitations will always travel in a northerly direction, and follow the course of the lunar node northwards.

22. Each century has its own peculiar typical and invariable epidemic.

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