(5) Another law may be stated, as a consequence of Kepler's third law and the distance relation, namely, *the periods of the planets are proportional to the cubes of simple integral numbers.*

The same integers as above are involved.

(6) In this connection the writer would bring to the attention of American scientists an effort by Viktor Goldschimt[1] to elucidate some of the numerical regularities in the distances of planets and satellites from their axes of revolution. The journal in which it occurs is not generally known. He observes the distances of the planets to be quite closely in the sequence 1/13, 1/7, 1/5, 1/3, 1, 2, 4, 6. The four larger planets are considered to have condensed together before the group of the four smaller ones. A mathematical treatment strictly analogous to the phenomena of *standing waves in sound,* the distribution of lines in spectra, the progress of crystallization and similar phenomena gives the same law of harmonic relations of distances not only for the planets but also for satellites. The harmonic sequences are as follows:

Condensations	0	1/3	1/2	2/3	1	3/2	2	3	∞
Large planets	0		1/2		1		2	3	∞
Small planets	0	1/3		2/3	1		2		∞
Jupiter's satellites	0		1/2	2/3	1		2		∞
Uranus' satellites	0		1/2	2/3	1	3/2			∞
Saturn inner satel.	0		1/2	2/3	1	3/2	2		∞
Saturn outer satel.	0				1	(6/5)		3	∞
Earth moon	0				1				∞

The sequences are brought into line by transformations derived from considerations of the dominance of certain positions, as the 0, 1 and ∞ in condensation.

(7) The writer would further approach the question of the regularities of the spacing of the planets from another basic point of view. In brief, considering the accurate correspondence of the velocity of a planet or satellite inversely to the square root of its distance from the axis of revolution, we may conceive the propagation of a wave of velocity at the initiation of revolution to follow the law of a logarithmic spiral. We should then expect the distances of the planets as well as their velocities to be represented as the radii vectors of a logarithmic spiral. The law we would propose is: *A small integral number of geometric means will determine the positions and velocities of all the planets and satellites.* This is suggested by the well-known properties of such spirals. Symbolically,

$$\log\ d = nk, \text{ or } e^{nk} = d$$

where d is the distance, k is a constant and n is a *simple integer.* A fairly accurate straight line plot is obtained by using values of n for the entire series between Mercury and Neptune, *1, 4, 5, 7, 10, 13, 16, 19* and *21.* The interval of 3 predominates. The velocity, v, is related to the above by the relation

$$\log\ v = k' - \frac{nk}{2}$$

where k' is another constant and n the *same simple integer as above.* It follows also that a similar logarithmic relation exists for the periods, that is, *a small number of geometric means will determine the periods.* If p stands for the period, then

$$\log\ p = \frac{3}{2}nk + k''$$

where k'' is still another constant and n is *the same simple integer as above.*

Similar relations may be derived for centripetal force and the like, but enough has been given here to indicate the underlying principle.

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[1] *Annalen der Naturphilosophie,* Vol. V, pp. 51–118.

A STUDY OF THE FIRE BLIGHT PATHOGEN, BACILLUS AMYLOVORUS, WITHIN LIVING TISSUES

IN a previous article Rosen and Groves[1] showed that blossom infection of Japanese (flowering) quince may readily be accomplished either by injections or by spraying with a water suspension of *Bacillus amylovorus.* The relative ease with which infections were obtained by either of these methods suggested a reexamination of the methods by which blossom infections are brought about under field conditions upon various hosts. In the meantime, an article by Miller[2] appeared in which stomatal infections were described for a young apple leaf and for the "inside of the receptacle cups of apple and pear flowers that were open when inoculated." The present note is for the purpose of calling attention to the wholly unexpected results that have been obtained in petalary infections of pear blossoms. A more detailed report, with photomicrographs, will appear later.

When pear blossoms in which the petals are closed and tightly clasped together are sprayed with a water suspension of *B. amylovorus* and placed in a moist chamber for twenty-four to forty-eight hours, infections will commonly occur on receptacles, sepals and petals. The number of infections as well as the extent of any one individual infection will depend on a number of conditions and it can be reported that infections may be obtained in great numbers within forty-eight to seventy-two hours after inoculation. It seems

[1] *Jour. Agr. Res.,* 37: 493–505, 1928.
[2] SCIENCE, 68: 386–388, 1928.

that such infections have not been recorded as yet in the literature on this disease.

The main purpose of this note is to direct attention to the infections on the petals. When a single petal containing one or more localized infections is mounted in water and examined under the microscope the bacteria can be observed within the living tissues without recourse to sectioning or staining. The very delicate, translucent, petalary tissues admit of remarkably clear views of the interior structures, and at magnifications of around 800 the live bacteria can be readily observed. For studying the activity of micro-organisms within living tissues it would be difficult to find more suitable material than these petals. Aside from this, any one who has attempted to study blighted tissues knows how difficult it is to avoid losing large numbers of bacteria in the process of obtaining histological sections.

The forty-eight-hour-old infections take the form of dark, discolored spots which are more or less limited in size and have a well-defined margin. Under the microscope the discolored tissue is readily distinguished from the adjoining healthy part and is seen to consist of a zone of cells between which the bacteria can be traced to the very margin of the discolored region, strongly suggesting that the discoloration and possibly other pathological phenomena are associated with the immediate presence of the bacteria.

This close association of diseased cells with the bacteria is further emphasized by the enormous numbers of rods that are wedged in tightly between the cells, numbers far beyond anything that has previously been noted or pictured for any blighted tissue. For the present it may be briefly recorded that a great deal more is involved here than passage through intercellular spaces. *B. amylovorus* within petals acts as a strict parasite whose growth and reproduction is confined to living host cells. The method of penetration and the cytological and pathological phenomena noted in the infected region will be reported later.

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PROPOSED AMENDMENTS TO THE INTERNATIONAL RULES OF NOMENCLATURE

1. Art. 19. Amend to read:

Botanical nomenclature begins for all groups of plants (recent and fossil) at 1753 (Linnaeus, "Species Plantarum," ed. 1).

It is agreed to associate genera, the names of which appear in Linnaeus's "Species Plantarum," ed. 1, with the descriptions given of them in the "Genera Plantarum," ed. 5 (1754).

2. Art. 49 bis. Amend by eliminating the words: "starting from Fries, *Systema*, or Persoon, *Synopsis*"; and for the words "teleutospore or its equivalent" substitute the words: "uredospore or teleutospore (sporophyte)."

Also replace the first example by the following: The names *Aecidium* Pers., *Roestelia* Reb., *Aecidiolum* Unger. and *Peridermium* Chev. designate different states of the gametophyte in the group *Uredinales*. The generic name *Aecidium* Pers. [in Gmel. Syst. Nat. II. (1791)], belonging to a gametophytic state can not displace *Gymnosporangium* Hedw. f., [DC. Fl. Fr. II. (1805)] based upon the sporophyte.

3. Add the following genera to the list of Nomina Conservanda: *Uromyces* (Link) Unger, 1833 (in place of *Nigredo* Rouss., 1806, *Caeomurus* (Link) S. F. Gray, 1821, or *Pucciniola* March., 1829); *Puccinia* Pers., 1794 (in place of *Puccinia* [Micheli] Adans., 1763, or *Puccinia* Willd., 1787); *Gymnosporangium* Hedw. f., 1805 (in place of *Puccinia* [Micheli] Adans., 1763; *Melampsora* Cast., 1843 (in place of *Uredo* Pers., 1794).

Comments: In the considerable number of replies to the circular letter distributed to many botanists early in March, and printed in *Mycologia* (21: 172–174), there was almost unanimous agreement to the proposed amendment to Article 19, as given above. The replies came from leading writers in systematic botany, mycology, algology, bacteriology, paleobotany, bryology and other divisions of the subject.

The proposed amendment to Article 49 bis., as previously suggested by the author, met with decided opposition. As now worded, it has the effect to restore the original intention of the "Rule," as adopted at Brussels. It eliminates the aecidiospore, and thereby disposes of many recent combinations, to which much objection has been made. It retains the uredospore, which belongs to the same state of the fungus as the teleutospore, for otherwise many familiar names would be rejected, such as *Coleosporium Ipomoeae* Burr., *Uromyces Fabae* deBary, *U. appendiculatus* Fries, *Puccinia glumarum* Erikss. and Henn., *P. Porri* Wint. and other generally accepted names. It also conserves such names as *Puccinia graminis, P. sessilis, P. coronata, P. Poarum, P. limosa,* etc.

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ODD STORIES ABOUT SCIENTIFIC NAMES

THE other day I was swapping taxonomic yarns with a fellow entomologist and it occurred to me that there must be many readable stories of that kind that have not yet been published. So I am sending two of those stories, that I told, to SCIENCE with the idea that perhaps other zoologists and botanists will send others in from time to time, so that