BACTERIAL SPOT OF COWPEA

A RATHER destructive bacterial disease of cowpeas characterized by spots on the leaves, stems and pods has been noted in Indiana since 1919. On the leaves the spots are irregularly circular and one to three millimeters in diameter with a maroon border and buff center. The lesions are not noticeably delimited by the veins. Young lesions are greasy and water-soaked. On the pods the spots are irregularly circular, one to eight millimeters in diameter, and maroon in color, often with a sunken center and a watersoaked border. Early infection may cause a constriction of the pod and stunting of the distal portion. Seeds under pod lesions may be stunted, shriveled or discolored. Dark red, elliptical to linear, sunken lesions are formed on the petioles and stems. In addition to lesions on cotyledons, first leaves, hypoctyls and epicotyls, localized vascular infection and partial wilting may occur among seedlings grown from infected seed.

Numerous isolations and successful inoculations have proved that the disease is due to an apparently undescribed species of bacteria which may be briefly characterized as follows:

Bacterium vignæ, n. sp.[1]

Cylindrical rods, rounded at ends, solitary or in pairs; individual rods 1.5 to 2μ by 0.5μ; motile by 1 to 5 polar flagella at one or both poles; ærobic; no spores; no capsules. Gram negative; most readily stained with gentian violet.

Superficial colonies on potato agar, round, smooth, shining, raised, pulvinate, or umbonate; finely granular, often showing a concentric pattern, grayish white in reflected light, slightly greenish fluorescent in transmitted light.

Gelatin rapidly liquefied; casein digested and no acid produced in milk; nitrates not reduced; no gas with various carbohydrates and no acid except for small amount with dextrose and saccharose; starch not hydrolized.

[1] According to Migula's classification and the revision adopted by the committee of the Society of American Bacteriologists (Winslow, C.-E. A., Broadhurst, Jean, Buchanan, R. E., Krumwiede, Charles, Jr., Rogers, L. A., and Smith, G. H.: "The Families and Genera of the Bacteria," *Jour. of Bact.,* 5: 191, 229, 1920) the combination would be *Pseudomonas vignæ* n. sp.

Growth and greenish pigment formation in Fermi's and Uschinsky's solutions. No growth in Cohn's solution. Slow liquefaction of blood serum and Loeffler's blood serum.

Growth inhibited by 5 per cent. sodium chloride. Growth in +12 and —15 broth and in p_H 4.8. Greenish pigment formation in alkaline broth.

Thermal deathpoint, 50° C. Killed by one hour's exposure to sunlight. Slowly killed by freezing in water. Quickly killed by desiccation on glass, but very resistant to desiccation on cowpea seeds.

Group number, 211.2322033.

Pathogenic on *Vigna sinensis* (L.) Endl.

The disease is seed borne and may be avoided, it is believed, by using seed from disease-free pods. A more detailed account of this disease is forthcoming.

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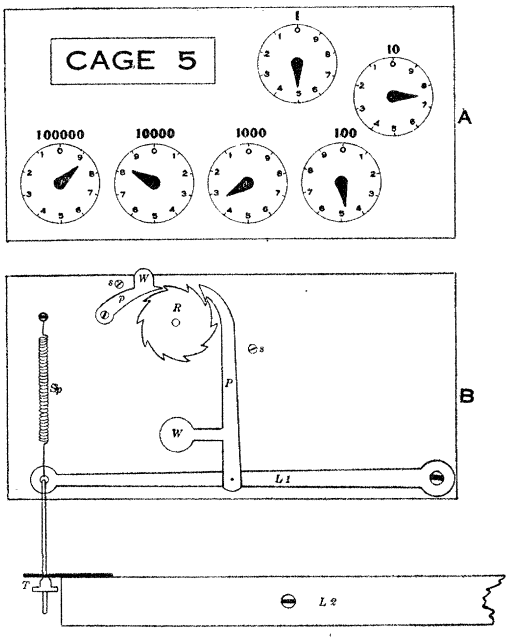
A REVOLUTION RECORDER

IN Volume 2 of the *Anatomical Record,* 1908, I described an apparatus for recording the activity of small mammals. In that apparatus the number of revolutions of the cage was recorded in hours, minutes and seconds by a clock. The task of converting thousands of readings of the clocks into their equivalent numbers of revolutions has been so tedious and time consuming that a new device which gives the number of revolutions at reading has been substituted for the clocks.

This device consists of a gas meter index so modified that successive dials have a ratio of 1 to 10. A new dial (10, figure A) has been introduced and the drive gear on shaft "1" has been changed to make the ratio 1 to 10. The two figures A and B show the front and back view respectively. A ratchet wheel (R, figure B) with ten teeth is attached to the shaft of dial 1. The two pawls (P and p) are so weighted (w) as to keep them in contact with the ratchet wheel. A stop (s) prevents the pawls from being thrown completely off the ratchet wheel. The long arm of the lever (L 2) (not shown in the figure), which rests on the axle of the revolving cage, is lifted each revolution by a rod on the end of the cage. This



causes a downward pull of the lever (L 1) to which pawl (P) is attached, the ratchet wheel is turned the distance of one tooth, and the hand on dial 1 moved one space. A spring (Sp.) lifts the lever (L 1) to its former position after lever (L 2) has returned to the axle of the cage. The number of revolutions made by the cage are thus automatically recorded in figures which can be read at a glance.

Our revolving cages were equipped with these counters about a year ago and we have found them very satisfactory and a saving of much valuable time.

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THE AMERICAN MATHEMATICAL SOCIETY

THE fiftieth regular meeting of the Chicago Section of the American Mathematical Society, being the eighteenth regular western meeting of the society, was held at Northwestern University, Evanston, Illinois, on Friday, December 29, 1922. The meetings were presided over by Professor Coble, chairman of the section, relieved by Professors Curtiss and Dickson. The following papers were presented. The paper by Professor Moore was presented by Mr. Wilder; the papers of Professor Jackson, Dr. Camp, and the first paper of Professor Chittenden were read by title:

Ruled surfaces with generators in one-to-one correspondence: E. P. LANE, University of Wisconsin.

Some theorems on continuous curves, with special reference to continuous curves that contain no simple closed curve: R. L. WILDER, University of Texas.

An analysis of the point-set which constitutes the boundary of a complementary domain of a continuous curve: R. L. WILDER.

An uncountable non-dense closed point-set each of whose complementary intervals abuts on another one at each of its ends: R. L. MOORE, University of Texas.

Closed sets of rational points on a plane cubic curve of genus one: MAYME I. LOGSDON, University of Chicago.

Report on a boundary value problem of fourth order: H. T. DAVIS, University of Wisconsin.

The extension of the Weddle and Kummer surfaces to hyperelliptic three-ways of genus three: A. B. COBLE, University of Illinois.

Associated sets of points: A. B. COBLE.

The rational linear algebras of maximum and minimum ranks: L. E. DICKSON, University of Chicago.

A new simple theory of hypercomplex integers: L. E. DICKSON.

Symmetric forms in n *variables:* ARNOLD DRESDEN, University of Wisconsin.

A general class of problems in approximation: DUNHAM JACKSON, University of Minnesota.

Abstract group definitions and applications: W. E. EDINGTON, Purdue University.

On an infinite system of non-abelian groups of order nm^n: W. E. EDINGTON.

On an infinite system of non-abelian groups of order nm^{n-1}: W. E. EDINGTON.

Note on a property of abstract sets which admit a definition of distance: E. W. CHITTENDEN, University of Iowa.

The Schmidt linear differential forms of a limited bilinear form in infinitely many variables: E. W. CHITTENDEN.

On a form of the property of Borel-Lebesgue which is independent of the closure of derived classes: E. W. CHITTENDEN.

Concerning an expansion in the restricted problem of three bodies: K. P. WILLIAMS, University of Indiana.

Expansions in terms of solutions of partial differential equations: C. C. CAMP, University of Illinois.

ARNOLD DRESDEN,
Secretary of the Chicago Section