concentration of acetone below the point which Allard[1] showed was non-toxic to the virus.

Absolute alcohol may be used in place of acetone under the above-mentioned conditions.

At about 100 per cent. saturation and −8° C. ammonium sulfate salts out from the juice, material which, when filtered off and sucked dry, dissolves readily in distilled water. Plants when inoculated with this solution take the disease. The filtrate when diluted, one to five, has in no case transmitted the disease; although the untreated juice when containing ammonium sulfate solution at a concentration of 3 cc. of a saturated solution to 10 cc. of the juice is infectious.

Solutions of Safranin-O have also been used to precipitate the virus from the plant juice. This gives a quantitative precipitation, which frees the juice of virus.

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BROWNIAN MOVEMENTS WITH LOW MAGNIFICATION

THE desire having arisen for conspicuous Brownian movements, a variety of materials was pulverized with a view to ascertaining which showed the movements to best advantage. For several reasons mica, particularly in the form of muscovite, was found preferable.

The suspension to be observed may be prepared as follows. A quantity of mica from the edge of a natural slab is ground by a dry emery wheel into an impalpable dust. This is stirred into a graduate of water and allowed to stand for some four hours. After the larger flakes have settled to the bottom, the thin milky suspension is siphoned off, care being taken not to draw off any of the useless residue at the same time. The concentration of the liquid may, of course, be altered as seems convenient by evaporation or dilution.

The liquid so prepared contains particles most of which are so small as to exhibit the Brownian movements. Under a magnification of fifty diameters with oblique illumination from below the microscope stage, the flakes appear as bright scintillating points in a dark field. This scintillation is evidently caused by small angular displacements due to the atomic bombardment; as the flakes rotate, they reflect the light at irregular intervals. Mica is peculiarly well adapted to this method of observation because each thin particle has a moment of inertia small in comparison with its reflecting area.

In such a field, the movements are still conspicuous with a magnification of ten diameters, and have been suspected with the naked eye.

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[1] Allard, H. A. *Jour. Agr. Res.* 13: p. 619 (1918).

SPECIAL ARTICLES

HYSTERESIS LOSS IN NICKEL OF DIFFERENT GRAIN-SIZE

THE hysteresis loss in specimens of nickel crystals, which varied from one grain per specimen to as high as 2.8×10^6, has been examined by Sucksmith and Potter[1] and found to increase rapidly as the number of crystal grains increased. Such an effect is not limited to specimens specially prepared as crystals, but may be found as well in strips of ordinary nickel which have been successively cold rolled to thinner and thinner specimens and thus the number of crystals per unit volume increased step by step as well as the hardness.

Of course all metals are crystalline, but in the case of the nickel strips which are cold rolled, it is not until severe cold working is performed that the crystals are more or less aligned[2] in one direction.

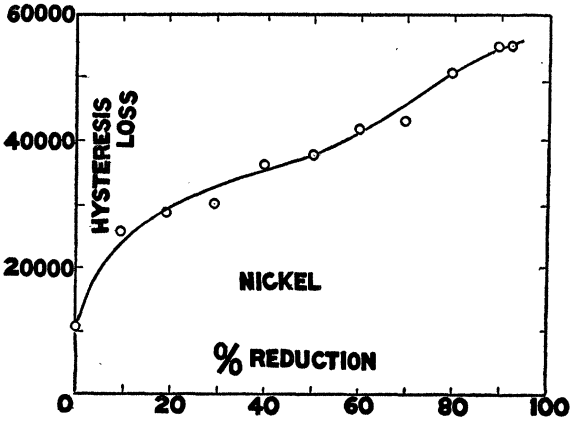
The present writer had occasion recently to study some of the magnetic properties of a series of eleven nickel strips reduced to various thicknesses by successive cold rolling. These strips were 57.7 cm. long and about 0.954 cm. wide. The thickest strip was .604 cm. in thickness and the ten succeeding strips were rolled from this thickness to those given by the percentage cold reduction in the following table:

No. of Strip	Per cent. cold reduction from mill records	Hysteresis loss Ergs/cm³/cycle	Thickness	Chemical Analysis	
1	0.0	10861	0.604	Nickel	98.88
2	9.7	26146	0.550	Iron	0.56
3	18.9	29165	0.496	Manganese	0.23
4	28.6	30538	0.435	Copper	0.16
5	39.5	37526	0.372	Carbon	0.09
6	50.0	38732	0.306	Silicon	0.06
7	59.5	42373	0.249	Sulphur	0.008
8	69.0	43924	0.194		
9	79.0	51086	0.133		
10	89.1	55144	0.070		
11	93.3	55042	0.044		

[1] Sucksmith and Potter, *Nature*, 118, p. 730, Nov. 20, 1926.

[2] Jeffries, *Trans. Amer. Inst. Min. & Met. Eng.*, 70, p. 303, 1924.

The photomicrographs[3] of these strips show a much finer grain structure for the specimens having the greater reduction in thickness and thus we assume that the per cent. of cold reduction is some measure of the number of crystal grains per unit volume even though with random orientation. We may, therefore, plot the relation between per cent. of cold reduction



and hysteresis loss. This is shown in Fig. 1 and confirms the relation found by others that large grain size is conducive to small hysteresis loss. Honda and Kaya[4] in a recent study of the magnetic properties of single crystals of iron find a similar law holding in their work. The same conclusion may be drawn from Gerlach's[5] curves for the magnetization of single iron crystals and electrolytic specimens. Sorensen[6] ascribed the high coercive force in thin films of iron, cobalt and nickel as due to the minute size of the crystals. Edwards[7] had a similar experience. The recent work of Ishagaki[8] on the effect of grain-size on the hardness of pure iron fits into the same picture.

It is interesting to note, on the other hand, that Welo and Baudisch[9] found for precipitated magnetite that "lean hysteresis loops, low coercitivities and low remanences are associated with oxides composed of small crystals."

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[3] Williams, *Proc. A. S. S. T.*, 1926.

[4] Honda and Kaya, *Sci. Reps.* Tohoku Imp. Univ., 15, p. 729, Nov., 1926.

[5] Gerlach, *Ztschr. f. Phys.*, 38, p. 832, 1926.

[6] Sorensen, Amer. Phys. Soc. Program, Abstract, Nov. 28–29, 1924, *Phys. Rev.*, 24, p. 658, 1924.

[7] Edwards, Amer. Phys. Soc. Program Abstract, Dec. 28–30, 1925.

[8] Ishagaki, *Sci. Reps.*, Tohoku Imp. Univ., 16, p. 285, 1927.

[9] Welo and Baudisch, Amer. Phys. Program, Abstract, Feb. 26–27, 1926.

A DYSENTERY-LIKE BACILLUS FROM A PHLEGMONOUS INFLAMMATION

THE bacilli belonging to the dysentery group have with few exceptions been isolated from the intestinal and urinary tracts. The writer has found but one reference to the isolation of one of this group from an extremity. Magnusson, 1919,[1] isolated a dysentery bacillus, which he named *Bacterium viscosum equi,* from "joint ill" in foals. Since the bacillus to be described was isolated from a phlegmonous inflammation of the lower leg and foot of a man, it will, perhaps, be of interest.

The isolated bacillus has the following characteristics:

Non-motile, Gram-negative, non-spore-forming, short rods.

Aerobic and facultative anaerobic.

Gelatin colonies: grayish-white, raised, entire.

Gelatin stab: no liquefaction.

Agar colonies: gray, smooth, entire.

Agar slant: gray, smooth, glistening.

Broth: turbid.

Milk: acid. Slow coagulation.

Indol is formed.

Acetyl-methyl-carbinol not formed.

Nitrates not reduced.

H_2S not formed.

Acid, but not gas, in lactose, saccharose, mannite, dextrose, maltose, raffinose, arabinose, adonite, sorbite, galactose, levulose, salicin, glycerin, xylose and trehalose.

No acid or gas in dulcite, dextrin, inulin, inosite, amygdalin or rhamnose.

Andrewes, 1918,[2] proposed the name *Bacillus dispar* for all lactose-fermenting members of the dysentery group, but *Bacillus madampensis* Castellani, 1912, and *Bacillus ceylonensis* Castellani, 1909, were evidently included in the group as shown by the reaction of the strains of *B. dispar* to dulcite.

The bacillus herein described differs from *B. madampensis* in that it ferments adonite and salicin, and does not ferment dextrin nor rhamnose. The nonfermentation of dulcite differentiates the bacillus from *B. ceylonensis.*

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THE SELECTIVE EFFECT OF POLARIZED RADIATIONS ON CERTAIN PHOTOCHEMICAL REACTIONS

THE selective effects of polarized light as compared with ordinary light on biochemical reactions

[1] *Jour. Comp. Path. and Therap.*, 32, 143.

[2] *Lancet*, 1918, 1, 560.