Non-reduction takes place in some cells, as already described in triploid plants[2], resulting in 2 giant cells from each pollen-mother-cell instead of the 4 pollen grains expected after reduction. The pollen-mother-cells are about half the volume of the pollen-mother-cells of diploid Daturas. Apparently the giant cells form the surviving pollen grains of the haploid. Since they are half the size of mother-cells from which they arise (or one quarter the size of the mother-cells of diploids) they are equal in size to normal pollen grains of diploids and may be expected to function in the same manner.

Haploidy is the normal condition in gametophytes of all plants and is a regular occurrence in the males of such insects as honey bees, which, however, fail to undergo reduction at the formation of gametes. It has been reported as an occasional phenomenon in sporophytes of ferns.

A haploid plant in *Datura* is a genetic novelty among flowering plants for two reasons: first, it is a sporophyte and yet has the somatic chromosome number characteristic of the gametophyte of the species; and second, the chromosomes while in monosomes, or sets of one each, still undergo a process of reduction though without synaptic mates.

A. F. BLAKESLEE
JOHN BELLING
M. E. FARNHAM
A. DOROTHY BERGNER

CARNEGIE STATION FOR
EXPERIMENTAL EVOLUTION

THE MASS OF THE ELECTRON AT SLOW VELOCITY

ALL assumptions regarding the form of the electron in motion, with the possible exception of the Parsons magneton, lead to expressions for the longitudinal and transverse masses such that the mass of the electron at slow velocity is a constant, m_o, independent of the direction in which the inertia test is applied.

An experimental confirmation is being carried out with an apparatus similar to that previously used by one of the authors[1] except that the cold cathode is replaced by an incandescent filament to assure the presence of all possible velocities at the same time.

If an electron beam accelerated by a given discharge voltage emerges from a tube in the anode into the region between two horizontal metal plates forming an electrostatic field and if the electrostatic field be produced by the same voltage as the discharge, or a constant fractional part of it, then the point where the beam will strike the lower (positive) plate is independent of the discharge voltage and hence independent of the velocity of the electrons provided the transverse and longitudinal masses be equal. This will be the case for velocities below 10,000 volts.

Visual results show the position of the spot on the phosphorescent screen deposited on the lower metal plate to be independent of the exciting voltage, thus confirming the equality of the masses at slow velocity. The photographic record of spot position and a more complete description will be given later.

The method is equally applicable to electrons of high velocity. The experimental work of verifying the expressions for the transverse and longitudinal masses at high velocity is being continued.

L. T. JONES
H. O. HOLTE

THE HYDROGEN-ION CONCENTRATION OF SOILS AS AFFECTED BY DRYING[1]

MUCH interest has been manifested of late in the determination of the concentration of hydrogen-ions in agricultural soils and in the study and possible correlation of data thus secured. It was my privilege to attend the meetings of the American Chemical Society in New York last fall and, in one of the sections, to listen to a somewhat lengthy discussion of the probable effect of drying and heating soils on their P_H values. The discussion was of necessity largely a matter of opinion due to the paucity of experimental data bearing directly upon this phase of the subject.

During the past few months, in connection with research projects relating to the subjects of acidity and aluminum toxicity in soils, the

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[2] Belling, John, and A. F. Blakeslee: "The assortment of chromosomes in triploid Daturas." In press for *Amer. Nat.*

[1] L. T. Jones: *Phys. Rev.*, 8, p. 52, 1916.

[1] Contribution 286 of the Station.

writer has had occasion to make large numbers of H-ion determinations, the gas-chain-electrometric method originally proposed by Hildebrand[2] and later modified for soil work by Sharp and Hoagland,[3] being employed.[4]

As is widely known, the Rhode Island Station has conducted several series of field plot experiments representing different rotations and various methods of fertilization, with but slight change over a period of more than thirty years. It is thus possible, by a proper choice of plots, to secure field samples of surface soils varying in P_H from 4.4 to 7.8 with a difference of but a few tenths of a P_H unit between successive samples. The following table presents data from such a series of samples, which are thought to be representative of the plots sampled.[5] The moist composite soil samples in tight Mason jars were brought to the laboratory immediately, rubbed through a ¼inch sieve, and the H-ion determinations made the same day as collected. Column 2 in the subjoined table presents the H-ion concentrations of these fresh soil samples. Portions of these same samples were then air-dried in the shade, and other portions oven-dried at 103° C. for a period of six hours. The last two columns give the P_H data secured from these dried soils.

H-ION CONCENTRATIONS OF FRESH AND DRIED SOILS

Soil No.	P_H Fresh, moist soil	P_H Air-dried soil	P_H Oven-dried soil
1	4.36	4.38	4.30
2	4.77	4.73	4.63
3	4.67	4.67	4.46
4	5.20	5.00	4.82
5	5.47	5.41	5.17
6	6.05	5.82	5.97
7	6.15	6.07	6.15
8	6.30	6.32	6.41
9	6.56	6.50	6.49
10	7.00	6.98	7.00
11	6.86	6.47	6.54
12	7.55	7.32	7.20
13	7.42	7.19	7.00
14	7.78	7.57	7.39

The following conclusions may be drawn from the accompanying figures. Drying *acid* soils, either at room temperatures or at 103° C., has but little effect on their H-ion concentrations as subsequently determined, although there appears to be a tendency toward slightly increased acidity at the higher temperature in practically every case. Drying *alkaline* soils, however, renders them decidedly less alkaline (decreases the OH-ion concentrations). This is especially noticeable where a temperature of 103° C. is used. In the case of soil 13, a decrease of 0.42 of a P_H unit is recorded, while soil 14 shows a decrease of 0.39 of a P_H unit. In the case of an exactly neutral soil (No. 10), drying has practically no effect. The reasons for these differences are somewhat obscure, although drying is doubtless accompanied by oxidation which is in itself an acidic process. It should be recalled that the soils in question are granitic soils of high potential acidity. Drying, heating, or otherwise profoundly changing them might conceivably present newly exposed surfaces to the solvent, possibly by removing certain enveloping colloidal materials of more or less alkaline nature; the definite fracture of certain of the mineral particles, thus directly exposing freshly abraded surfaces to the solvent is also by no means impossible. Further work will be necessary to establish a definite explanation. It is hoped that similar data from soils of widely different genesis may be forthcoming.

Paul S. Burgess

Rhode Island Agricultural
Experiment Station

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[2] Hildebrand, J. H., 1913, "Some Applications of the Hydrogen Electrode in Analysis, Research and Teaching." *Jour. Am. Chem. Soc.*, 35, p. 847-871.

[3] Sharp, L. T., and Hoagland, D. R., 1916, "Acidity and Adsorption in Soils as Measured by the Hydrogen Electrode." *Jour. Agr. Res.*, VII, p. 123-145.

[4] The hydrogen electrode vessel was constantly shaken during saturation by a device operated by a small motor. This vessel carried two platinized electrodes, thus permitting duplicate voltage readings on the same solutions. This has been found by the writer to be a necessary precaution, as occasionally an electrode will "go bad" in slight degree only, and if no check is available, wrong results are unwittingly reported. Both electrodes in all of the above-listed results gave identical readings.

[5] The soil of all the plots is classified by the United States Bureau of Soils as Miami silt loam.