polarity only when that factor is weakened by some such condition as unusual shortness of the piece.

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THE EFFECT OF DRYING UPON THE ACIDITY OF SOIL SAMPLES[1]

BURGESS[2] has recently reported a study of the effect of air and oven drying upon the H-ion concentration of soils, using samples of Miami silt loam from a series of plots at the Rhode Island Agricultural Experiment Station. He found that drying had little or no effect upon acid soils, but increased the H-ion concentration of alkaline soils.

In an investigation of the H-ion concentration of Minnesota soils that has been in progress for some time at this laboratory, numerous samples of soil from different parts of the state and from soil types of different genesis have been tested. Early in the investigation we tried to determine the proper conditions of moistness and freshness of the samples and have now satisfied ourselves that the determinations should be made with soil freshly taken from the field from which little or no moisture has been allowed to escape. Only then are the results a reliable indication of the conditions actually existing in the field.

In order to determine the effect of drying upon the H-ion concentration, we made determinations upon about 200 samples of soils in both the moist and the air-dry condition. With part of these oven-dried samples also were used. All the determinations were made by the gas chain electrometric method.

Comparing samples from five of our experimental fields, the soils of which are naturally acid, we find that samples from one field show marked changes upon being allowed to become air dry; those from two fields change somewhat less, but still appreciably, and those from the remaining two change only slightly. Generally the H-ion concentration increased, but in a few instances it decreased. With the samples from plots where sufficient lime or marl had been added to make the soil alkaline, some showed no change in H-ion concentration, some an increase and others a decrease upon air-drying.

A group of 92 glacial soils, partly acid and partly alkaline, were found after air-drying to be decidedly more acid than before, the alkaline soils, however, showing the more marked change. A group of loessial soils, on the whole more acid than the glacial soils, showed less change.

Oven-drying was found to increase the H-ion concentration more than air-drying. Samples moistened after air-drying became more acid than the original moist samples and usually more acid than the air-dried samples. Moist samples kept in air-tight glass containers generally become more acid on standing; out of 20 samples tested, 13 became more acid, five showed little change and two became less acid.

H-ION CONCENTRATIONS OF FRESH AND DRIED SOILS SHOWING VARIABLE EFFECT OF DRYING AND REMOISTENING

Sample No.	Formation	Fresh pH	Air-Dried pH	Oven-Dried pH	Remoistened pH
1	Glacial Outwash	5.53	5.79	.....	.....
2	" "	6.32	5.33	5.21	.....
3	" "	7.20	6.54	6.04	.....
4	" "	7.34	7.66	.....	.....
5	Till Plain	5.44	5.19	.....	5.28
6	"	5.60	5.46	.....	5.04
7	"	5.78	5.74	.....	.....
8	"	6.20	5.90	5.55	5.50
9	"	6.49	5.11	.....	.....
10	"	7.19	6.54	.....	6.15
11	"	8.00	7.39	7.79	.....
12	Loessial	5.87	5.80	5.31	.....
13	"	6.32	5.90	5.19	5.02
14	"	6.63	6.12	5.34	.....
15	"	7.51	7.13	.....	.....

Air-dried samples, when tested by the qualitative potassium thiocyanate method, gave a more acid reaction than moist ones freshly taken from the field. The full data are now being prepared for publication, but the accompanying few given in the table will serve to illustrate the magnitude of the changes we have found.

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THE BENEFICIAL EFFECT TO WHEAT GROWTH DUE TO DEPLETION OF AVAILABLE PHOSPHORUS IN THE CULTURE MEDIA

THE exceptionally good growth wheat seedlings, grown four weeks in complete nutrient solutions, make when transferred to aqueous culture media that contain all essential nutritive salt elements except phosphorus, presents a problem of great importance from the standpoint both of theory relating to fertilizer practice and of that pertaining to the physiology of the wheat plant. In experiments designed to test the effects of the absence of the commonly assumed essential elements in the culture media at various stages of growth on the development of wheat, it

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[2] SCIENCE, 1922, N. S., 55, 647–648.