The mammary glands of the animals on the 1.0 mg level of androstane-diol showed a remarkable proliferation. The development of the ducts was complete and many lobules were present. All acini showed definite secretory activity, but not lactation. Androstene-dione at the 1.0 mg level showed a similar, but less marked effect. Androsterone exerted no detectable influence on the mammary glands.

The uteri of the animals injected with androstane-diol (1.0 mg) showed a marked increase in connective tissue and smooth muscle and were not only much larger than the uteri of castrate controls, but were larger than at the beginning of the experiment. The uteri of the animals that received androstene-dione showed a slight stimulation, while those of the androsterone series were typically castrate.

The vaginal smears of all animals were consistently dioestrus throughout the experiment. In section the vaginas of the animals injected with androstane-diol and androstene-dione showed a slight mucification, while those of the androsterone-treated animals were typically castrate.

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FIXATION OF POTASSIUM IN SOILS[1]

FOR more than half a century the problem of K fixation in soils was investigated and discussed. It was noted that when soluble potassium was added to the soil a large portion of the K became unavailable. With the clarification of the phenomena of base exchange the immobilization of soluble K in soils was considered from the standpoint not only of its insolubility in H_2O, but also in the sense of its being non-replaceable. A number of postulates have been suggested on the mode of fixation. It was natural to suspect the silicates, the primary source of K in soils, as the seat of reactions involving fixation of the K added or released in soils. The one postulate which gained popularity in recent years was that the soluble K in soils reverts to a difficultly soluble complex resembling muscovite. No definite evidence to prove this contention has been advanced. It is perhaps somewhat far fetched to think of the formation of silicate minerals of K under conditions of temperature and pressure prevailing in the soil.

In a series of experiments, conducted by the authors, with artificially prepared silicates of various ratios of SiO_2/basoids subjected to alternate wetting and drying, no fixation of K could be demonstrated. The attention was then directed to other acidoids and it was found that the phosphates of a number of cation linkages are capable of fixing K in unavailable or non-replaceable form.

Aluminum and iron phosphates were prepared and treated with solutions of KCl corresponding to applications of 7.6 per cent. of the total dry weight of the respective phosphate complexes. These systems, prepared in triplicates, were then alternately wetted and dried five times at 23°, 35° and 70° C. The complexes dried at 70° C. fixed the largest quantities. The iron phosphate fixed 72.15 milliequivalents of K per 100 grams, which represents 57.85 per cent. of the total KCl applied, and aluminum phosphate fixed 71.43 milliequivalents, which represents 57.14 per cent. of the KCl applied.

Other cation linkages have been tested under various conditions and they also were found to fix the K.

There is an indication that the NH_4 ion and perhaps other cations may be fixed in the same manner.

Pedological data on hand seem to fit in with the findings of the laboratory experiments on the fixation of K through the medium of phosphated complexes. There is a definite relation between the phosphated complexes of various cation linkages and the extent of K fixation.

A more detailed description of the data on hand, the probable chemical reactions involved in the mode of fixation of K by the phosphate complexes, and the implications involved with respect to systems of fertilization will be dealt with in a more extensive manner in a paper to be submitted to *Soil Science*.

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NEW JERSEY AGRICULTURAL EXPERIMENT STATION

SCIENTIFIC APPARATUS AND LABORATORY METHODS

A NEW TECHNIQUE FOR PRODUCING LESIONS OF THE ENCEPHALON CORTEX

TECHNIQUES for producing controlled lesions of the encephalon that are uniform in depth and limited to the cortical layers are comparatively crude and unsatisfactory. This is particularly the case when large lesions are desired and when chronic preparations are necessary. With small animals such as the rat, added difficulties arise from the spatial limitations of the small field of operation.

By adapting the copper point of an electric soldering iron, Dusser de Barenne[1,2] has devised probably

[1] Journal Series paper of the New Jersey Agricultural Experiment Station, department of soil chemistry and bacteriology.

[1] J. G. Dusser de Barenne, *Zeit. f. d. Ges. Neur. u. Psychiat.*, 147: 280, 1933.