patients showed a marked change in the direction of metrokinetic behavior. Catatonic patients lost their rigidity and their cataleptic symptoms. Patients with agitated depressions became quiet. Hyperkinetic depressions were changed to normal states of motor activity.

The mood appeared indifferent or mildly euphoric. Anxiety and apprehension gave place to mild indifference with a tendency to joke. In no case did we find a change in the essential structure of the systems of delusions and of perceptive distortions.

Our studies show that sleep and narcosis are not necessary conditions for the production of the mental changes discovered by previous authors as the result of sodium amytal injection. In normal individuals the drug produces a mild euphoria and a release in inhibitions and reserve which usually prohibit the individual from communicating about matters of emotional significance. The same mechanism seems to be at work in psychotic patients where it makes possible communications of the thought content, inaccessible to the usual means of clinical approach. The value of the method described above for diagnosis and for psychopathological investigation of psychiatric conditions seems to be established. The effect of sodium amytal in this respect is similar to that of cocaine which was used by Berger in Germany. Amytal is to be preferred because it does not seem to have any undesired concomitant effects. The therapeutic influence of the drug does not seem to be specific. It allows a period of emotional rapport with the patient and gives access to thought material which can be utilized for subsequent psychotherapeutic efforts.

5573

Exchange of Oestrin and Corpus Luteum Hormones in Parabiotic Female Rats.*

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In a previous paper the author has described a method for testing the amount of blood exchange in parabiotic rats.[1] A large series

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[1] Hill, Robert T., PROC. SOC. EXP. BIOL. AND MED., 1931, **28**, 592.

of twins show that an average of 24% of dye is found in the uninjected animal at the end of one hour. Normal parabiotic female rats thus tested for their vascular connections come to maturity independent of each other. There is sufficient oestrus producing hormone exchanged to disturb slightly the cycles of each twin member, but not enough to synchronize them. The finer individual differences of each pair, according to a higher or lower amount of blood exchange are still under investigation.

In a series of 11 pairs in which the oestrus cycles had been followed over a long period, both ovaries were removed from one female. The castrate subsequently goes into anoestrum and only occasionally shows signs of oestrus while the normal female co-twin has normal cycles. This agrees with the above mentioned fact that there is little interference of oestrus in pairs of normal females. Our results vary from those of Martins,[2] who describes the production of oestrus in a castrate member by carry-over of hormones from the normal co-twin. The rats he used were put in parabiosis with the body cavities joined (coelioanastomosis). In this condition it is possible that some hormone exchange may take place also through the medium of the peritoneal fluids and not exclusively through the blood. To check this we have followed the cycles of 9 pairs, one member a castrate, in which the body cavities were not connected, and of 2 pairs in which they were in open connection. At present no difference has been noted between the 2 conditions.

At variance with the results of Zacherl[3] we have found that during pregnancy of one mate the oestrus cycles of the non-pregnant twin are from the beginning almost entirely inhibited by the action of the corpus luteum hormone of the pregnant member. In groups IX and XX fertilization occurred in the left member. Oestrus nearly ceases in both members of each pair after the start of pregnancy until a few days after parturition, when normal oestrus returns in the absence of nursing young. The curves of groups XXI and XXII show the consequences of the effect of a period of lactation following parturition. As usual the lactating female stays in dioestrum. After parturition in group XXI the non-pregnant member started oestrus, but did not show the normal rhythm. Parturition in group XXII was followed by onset of normal oestrus in the non-pregnant co-twin. Stopping of lactation is followed by normal oestrus in both members of a pair.

[2] Martins, Thales., *Compt. Rend. Soc. Biol.*, 1929, **102**, 605, 614.

[3] Zacherl, H., *Klin. Wochenschrift.*, 1927, **6**, 1614.

The above facts reveal a striking difference between the oestrus and corpus luteum hormones. It may be explained in 2 ways. Either the corpus luteum hormone is secreted in a greater surplus than oestrin, or it may be absorbed more slowly, which would allow for a more nearly even distribution between both members of a pair.

Furthermore, the hormones transferred during pregnancy from the pregnant member stimulate partial hypertrophy of the mammary glands of the non-pregnant co-twin.

5574

Soil Aeration as a Factor in Growth and Root Development of Plants.

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The soil in which certain aquatic and terrestial angiosperms were growing was slowly aerated daily for a period of one-half to 5 hours by means of compressed air supplied through perforated coils imbedded 8 inches below the surface. *Helianthus annuus, Triticum vulgare, Glycine soja, Linum usitatissimum* and cuttings of *Vitis vulpina* were grown in sand and in loam. At the age of 2 months conspicuous differences were apparent in aerated and unaerated plants on the same soil as well as between plants similarly treated but in different soils. As might be anticipated aeration did not produce the same effects in plants grown in loam and in sandy soil. Structural differences occurred in both tops and root systems, but especially the latter.

In general, roots in the aerated soils were distinctly fibrous in character, more numerous and longer, forming branches of secondary and tertiary rank. Total surface in aerated roots was twice or more that of control roots, but the root hair zone was smaller. Fewer hairs developed and these in turn were not as long-lived in aerated plants as in the controls due to the more rapid elongation of the aerated roots. Vascular elements a few inches above the root hair zone were less developed in aerated roots.

The striking effect of aeration on tops was acceleration of growth in early stages, attributable to increased length of basal internodes rather than to an increase in the number. Contrast in internodal distance diminished noticeably, however, above the median nodes