

particularly in such cases where we meet an amazing plasticity in the adaptation of the behaviour to unusual conditions.

By means of a film, Prof. Katz showed the results of investigations on the dissolution of the family in hens. Many factors influence the process of the dissolution of the family. In general, the family lasts so long as a certain physiological state of the hen exists. But in addition to this physiological state, there exist psychological factors which influence the duration of the family group. The hen keeps the chicks the longer the fewer their number, and this irrespective of their size. The dissolution of the family takes place in an active way, the hen actually driving away her chicks. The maternal drive, however, seems to revive again in the presence of danger. The chicks when driven away by the hen keep together for a certain time, forming a gynopædium.

In a second film, Prof. Katz showed the results of interesting experiments carried out on the localisation of sounds by dogs. A dog is trained to run to a small screen behind which a noise, of about half a second's duration, is produced by means of an electric buzzer. Several screens are then placed in a row, the buzzer is sounded, and the dog has to locate the noise by running directly to the appropriate screen. The performances of the dog in locating the noises are amazing. The dog is even successful in distinguishing between two screens when the two are not more than 25 cm. apart, although its own distance from them both at the start is about 5 m. Scarcely any error appears when the dog sits in the centre of a circle of about 10 m. diameter, and 64 screens are distributed at equal distances on the circumference of the circle.

Dr. B. P. Wiesner showed two films demonstrating maternal behaviour in the rat. The studies on these subjects support the point of view of purposive psychology to a considerable extent, but also show that the activities of the animals are not regulated by the achievement of the 'purpose'; many activities are pursued well beyond this point and apparently without relation to field situation or to 'necessity' (*Beduerfnis*). The experiments were extended to a study of the physiological factors underlying maternal behaviour. Observations suggest that the exteroceptors normally engaged in the performance of maternal activities are not necessary for their occurrence but only for their direction. Endocrine factors originating in the pituitary gland (anterior lobe) are probably at the basis of maternal activities. It is possible to produce maternal behaviour in virgin rats by extracts from this gland.

### Inversion of *d*-Camphor

IN recent years, Messrs. Asahina and Ishidate, of the University of Tokyo, have been engaged in the investigation of derivatives of camphor and have collected some useful data bearing upon the constitution of these compounds. The results are published in the *Berichte der deutschen chemischen Gesellschaft*.

Although the camphor molecule contains two dissimilar asymmetric carbon atoms, it can, by reason of certain limitations imposed upon it by ring-closure, give rise only to two optical isomerides, namely, *d*-camphor and *l*-camphor, both of which are known and are designated as 2-keto-camphane

and 6-keto-camphane respectively. Similarly, 3- and 5-keto-camphanes form another optical pair, *l*-epi-camphor and *d*-epi-camphor. Now it has been known since 1914 that each camphor can be transformed into the epi-camphor of opposite sign, but in the August issue of the *Berichte*, Asahina and Ishidate explain how they have been able to effect the conversion of *d*-camphor into *d*-epi-camphor and the latter into *l*-camphor, thus inverting the molecular configuration, but in claiming to be the discoverers of *d*-epi-camphor, they have obviously overlooked the preparation of this substance by Furness and W. H. Perkin in 1914.

The complete cycle of changes as described by the Japanese authors in the inversion of *d*-camphor involves the preparation of 2-5-diketo-camphane from campherol, a product of animal metabolism, but, since Bredt and Goeb prepared the same diketone in 1920 by the oxidation of bornyl acetate, derived from *d*-camphor, to acetoxy-camphor and further oxidation of the hydrolysed product, it is obvious that life-processes are not an essential feature of the transformation.

Campherol was characterised as a mixture of at least two and probably four hydroxy-camphors, from which 5-hydroxy-camphor was isolated in the pure condition. On oxidation with chromic acid, this gave 2-5-diketo-camphane, a tautomeric mixture, of which the keto-modification could be stabilised by repeated recrystallisation from acetic acid. Hydrogen cyanide attaches itself exclusively to the 5-keto group of this compound, whereby a new 'asymmetric centre' is developed so that two stereoisomeric hydroxyacids are formed after hydrolysis. Resolution of this mixture is, however, unnecessary, because after reduction of the 2-keto group to methylene, the hydroxyacid group is reoxidised to carbonyl. The resulting product is 5-keto-camphane (*d*-epi-camphor), the configuration of the original asymmetric atoms remaining unaffected. The next step is to oxidise *d*-epi-camphor with selenium dioxide to 5-6-diketo-camphane or *d*-camphorquinone (the optical isomeride of ordinary *l*-camphorquinone from *d*-camphor). Reduction of this compound gives a mixture of 5-hydroxy-6-keto-camphane and 6-hydroxy-5-keto-camphane, the methyl ethers of which can be separated. Further reduction of the former with sodium amalgam gives *l*-camphor (6-keto-camphane), thus completing the inversion.

### University and Educational Intelligence

LONDON.—Dr. L. J. Witts, since 1929 assistant physician to Guy's Hospital, has been appointed professor of medicine (St. Bartholomew's Hospital Medical College); Prof. Geoffrey Hadfield, professor of pathology in the University of Bristol, has been appointed professor of pathology (St. Bartholomew's Hospital Medical College). The following appointments have been made in the British Postgraduate Medical School: Mr. A. A. Miles, demonstrator in the Department of Pathology at the University of Cambridge, to be reader in bacteriology; Dr. R. S. Aitken, first assistant to the Medical Unit at the London Hospital, to be reader in medicine; Dr. J. C. Moir, assistant to the Obstetric Unit at University College Hospital, to be reader in obstetrics and gynaecology; Dr. Earl J. King, assistant professor of medical research and director of the Sub-Department