in the usual sense of that word and, if so, to what needs they correspond (*e.g.* the search for food or the attraction of mating-partners), or whether they are at the offset developed without reference to the welfare of the organism.

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September 22.

Electrostatic Moments of Molecules.

I HAVE made recently some observations on the electrostatic moments of molecules. A beam of molecules, all having sensibly parallel velocities, was passed through an electrostatic field, so arranged that the quantity d^2v/dx^2 (x measured perpendicular to the direction of the molecular motion) was of the order of 10^6 e.s.u./cm.^{2}. Experiments were made on the metal potassium and on the compounds sodium chloride, mercuric chloride, and arsenic trioxide. It was found that potassium had a moment too small to detect, and it has been impossible so far to induce any polarisation in the molecule in the largest field used—330 e.s.u./cm. There was no deflexion which might be put down to the molecules (K)n. If such are present their concentration must be very small—less than 1 per cent. of the total number, or they have no moment and the field cannot polarise an appreciable number of them.

Some experiments of a qualitative sort have been done on the binary and ternary compounds sodium chloride and mercuric chloride. The molecules of both these substances were deflected appreciably by the field, and the moment was estimated to be of the order of magnitude 10^{-18} e.s.u. cm. As these experiments were done with the aid of a knife edge, it is difficult to estimate the field through which the molecules passed.

With a much better apparatus in which a charged wire was placed in the path of the moving molecules, an experiment was done on arsenic trioxide. In this case several deflected lines were visible, and the moment deduced appears to be somewhat larger than in the case of the other two salts. It is difficult without a systematic series of experiments to offer a definite interpretation of these observations, as there is to be taken into consideration a number of possible effects, for example, the rotational energy of the molecules, the polarisation which the field may induce in them, and finally, effects due to different molecular states.

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Lengthened Chain Compounds of Sulphur.

IN a recent issue of NATURE (August 21, p. 283) attention is directed to some lengthened chain compounds of sulphur described by Sir P. C. Rây and K. C. Bose-Rây (*J. Indian Chem. Soc.*, 1926, **3**, 75) as products of the interaction of dithioethylene glycol and ethylene dibromide. Of the three points which are emphasised by the authors, namely, (*a*) the isolation of a compound containing bromine, (*b*) the high molecular weight of this compound, and (*c*) its formulation as having a long chain structure, two cannot be regarded as new, whilst the evidence for the third is unconvincing. For the very similar reaction of ethylene dibromide with potassium sulphide was shown by Crafts so long ago as 1863 (*Annalen*, **128**, 220) to yield such substances of presumably high molecular weight containing 12-28 per cent. of bromine and with a ratio of C : H = 1 : 2. Moreover, the suggestion that these substances have a long open chain structure has recently been put forward on more than one occasion (*J. Chem. Soc.*, 1921, **119**, 1861; 1925, **127**, 2676).

It seems probable that such products are mixtures of substances of the general formula A . $(S . C_2H_4)_n$. S . B, where A and B may be alike or different and have any of the structures: $-CH_2 . CH_2OH$, $-CH : CH_2$, or $-CH_2 . CH_2X$ (where X is a halogen). If n be large, the composition of the whole will differ very slightly from that of a polymer of ethylene sulphide. But at the same time the easy isolation of a single pure chemical individual from such a mixture of closely related substances is not to be expected.

The experiments recorded by Sir P. C. Rây do not in fact provide any convincing evidence that such a separation of pure substances was effected, although it is claimed that this was so after one or two crystallisations. There are also several indications in the paper that the "compounds" were still mixtures. For example, it is improbable that members of what would constitute a single homologous series of compounds of the general formula Br . $C_2H_4(S . C_2H_4)_n$. Br would have the following melting points when pure:

Value of n	10	12	16	24	26	32	40	48
Melting point	120°	100°	162°	147°	145-155°	157-159°	170°	163°

In no case was the molecular weight of one of these substances satisfactorily confirmed. The ebullioscopic determination made on one of them led to a value about half of that expected (1486 in place of 3068). The authors attribute this to a surprising disruption of the molecule by the ethylene dibromide used as a solvent, but it is much more likely to be due to the presence from the first of a mixture of substances some of which do not contain bromine. In any case it cannot reasonably be claimed that any substance was shown to have the high molecular weight stated.

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Prof. Paul Kammerer.

I REGRET to have to announce the death of Prof. Dr. Paul Kammerer, who shot himself on the Hochschneeberg, near Vienna, on September 23. In a letter (received after his death) he accuses himself of failures in his personal affairs, but emphasises that he has never committed the scientific tricks hinted at by some of his critics. He deemed the rest of his life too short to be able to take up again the same experiments, and declared himself too weary for this task. Although other than these seem to have been the main causes for his weariness of life, yet this sad end to a precious life may be a warning to those who have impugned the honour of a fellow-worker on unproven grounds. It is in fulfilment of a wish expressed by Kammerer that I beg the editor of NATURE to publish his last word on the much-debated but not solved question of a particular one of his specimens. Having convinced himself of the state it is in now, Kammerer alleges that someone must have manipulated it; he does not allude to a suspicion whom this might have been.

Need I add that Kammerer's work on the modifiability of animals, especially on poecilogony and adaptation to colour of background in Salamandra and the reappearance of functional eyes in Proteus kept in appropriate light, will secure him a lasting place in the memory of biologists, even if some other of his papers were open to criticism.

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