species remained as univalents and were distributed at random. We have also observed this phenomenon in a more recently made hybrid of *biennis* and *setosa*" (p. 305).

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¹ Tischler, G. "Verknüpfungsversuche von Zytologie und Systematik bei den Blütenpflanzen." *Bericht. Deutsch. Bot. Gesell.*, **47**, 31-49; 1929.

² Collins, J. L., L. Hollingshead, and P. Avery. "Interspecific hybrids in *Crepis* III. Constant fertile forms containing chromosomes derived from two species." *Genetics*, **14**, 305-320; 1929.

The Mechanism of Formation of the Latent Photographic Image.

In 1925, with S. E. Sheppard and R. P. Loveland, I proposed the concentration speck theory of the latent image.¹ According to this hypothesis the action, during exposure, of pre-existing silver sulphide-containing specks (discovered by S. E. Sheppard²) on the surface of the silver halide grains of photographic emulsions, is confined to increasing their size by accretion of photochemically reduced silver atoms to form a nucleus large enough to induce developability. A mechanism of the formation of the latent image was proposed by me³ on the basis of the experimental results of G. B. Gudden and R. Pohl on photoconductance.⁴ It was supposed that the speck contains silver and silver sulphide, which, adsorbed on the surface of the silver halide crystal, form the electrodes of an elementary voltaic cell of the type Ag/AgBr/Ag₂S having silver halide as the electrolyte, the external circuit being completed by contact between the silver and the silver sulphide. The growth of the speck is due to the electrolytic deposition of silver from the electrolyte.

In a recent criticism F. C. Toy and G. B. Harrison⁵ regard such a theory as difficult to accept in the light of their experimental results. They point to the fact that exposure to light for a fraction of a second will normally make a photographic emulsion developable. They think that it would require an enormous increase in the voltage of the cell or a corresponding increase in the electrolytic conduction of the electrolyte to produce in this way a developable centre. This is not necessary. It is evident that the larger the speck is, below a certain limit giving spontaneous developability, the less the added number of silver atoms necessary to make the grain developable. Hence the less the exposure required for this and the greater the apparent sensitivity of the grain. They also consider that the variation of the photographic sensitivity with temperature presents a further difficulty. The sensitivity at the temperature of boiling liquid oxygen is apparently still too high to agree with an electrolytic photoconductance effect which may be expected to be vanishingly small at this temperature. This objection again ignores the effect of the size of the pre-existing speck. Only if sensitivity specks were totally absent would the temperature coefficient of photographic sensitivity be comparable with that of electrolytic photoconductance.

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¹ *J. Franklin Inst.*, **200**, 51; 1925.

² "Colloid Symposium Monograph", **3**, 76; 1925. *Phot. J.*, **65**, 380; 1925.

³ *J. Franklin Inst.*, **204**, 649; 1927. **205**, 111; 1928. *NATURE*, Nov. 19, 1927, **120**, p. 728.

⁴ *Physik. Zeitschr.*, **22**, 529; 1921. *Zeitschr. f. Physik*, **6**, 248; 1921. **7**, 65; 1921.

⁵ *Proc. Roy. Soc., A*, **127**, 613; 1930.

Molecular Weight Determination in Camphor Solution.

In view of the increasing use of a certain excellent and convenient procedure for the determination of molecular weights of substances cryoscopically in camphor solution, the observation should be made that the usual manner of reference to the method in our chemical journals scarcely bestows credit where it is most due.

In the year 1912 Jouniaux,¹ as a result of his "Étude de quelques mélanges binaires contenant du camphre", pointed out that "le camphre présente donc les qualités requises d'un bon solvant cryoscopique". Soon afterwards he published a paper,² entitled "Sur l'utilisation du camphre comme solvant cryoscopique", in which he noted the advantage that "un thermomètre ordinaire gradué en degrés" was quite satisfactory for the determinations of the necessary melting points.

In 1922 Rast,³ without reference to previous work, suggested that the determination of melting points of solutions in camphor of about 10 per cent strength (which, unlike stronger solutions, are seen from Jouniaux's results to exhibit sharp melting points) could conveniently be made in capillary tubes in the ordinary way. This was his only essential innovation.

Rast further (without discussion) adopted 400 as the molecular lowering of freezing point for camphor, calculating this value from melting points of salol-camphor mixtures given in Landolt-Börnstein-Roth (4th edn., p. 556) which themselves are taken from a paper by Caille.⁴ Jouniaux (loc. cit.) had previously deduced a higher value, namely, 498. The latter figure seems preferable, not only because camphor is known sometimes to combine with phenols,⁵ but also because it is subject to an independent confirmation.⁶ From van 't Hoff's relation the latent heat of fusion is seen to be 8.24 cal. Calculated from vapour pressure determinations of camphor by Ramsay and Young, Allen, and Vanstone, combined with a knowledge of the specific volumes of camphor in the liquid and solid states, a value of the latent heat of fusion is obtained actually identical with that deduced from van 't Hoff's equation. Better verification could not be desired.

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¹ *Bull. Soc. Chim.* (4), **11**, 546; 1912.

² *Ibid.*, p. 722.

³ *Ber.*, **55**, 1051, 3727; 1922.

⁴ *Compt. rend.*, **148**, 1461; 1909.

⁵ *Leger: Bl.* (3), **4**, 725; Caille: loc. cit.; Wood and Scott: *J.C.S.*, **97**, 1573; 1910.

⁶ Jouniaux: *Compt. rend.*, **154**, 1593; 1912.

Chemistry and Plant Protection.

To remedy the inadequacy of present-day insecticides and fungicides in the control of crop pests and diseases, two courses are open—the discovery of new insecticidal and fungicidal substances, and better utilisation of existing materials. In this second alternative the chemist has assisted, for example, in determining the one or more active constituents of complex mixtures such as tar oils, lime sulphur, and pyrethrum extract, and particularly in evolving methods of standardisation. The biologist, however, whilst continuing to look to the chemist for the provision of fresh materials, is inclined to forget what knowledge of existing fungicides and insecticides the chemist has already provided. With painful frequency, reports of trials appear in which the materials tested are inadequately described, though knowledge of the probable active constituents and their estimation is available. By failing to employ this knowledge in his field work the biologist obtains results which, lacking