

Mathematics. — BOTTEMA, O.: *The figure of four planes in R_5* . I, p. 30.

It is not always possible to characterise a quadruple of planes in five dimensional space by its invariants, but by means of the theory of invariant factors all special cases can be found. There are six types: A. the planes have three distinct transversals; B. there are two transversals, one of which is double; C. there is an isolated transversal and there are ∞^1 transversals belonging to a three dimensional space etc. An arbitrary quadruple has an automorphic group of four projective transformations (isomorphic with the Vierergruppe), but there exist special quadruples (of type A) being invariant for a group of 8, 12 or 24 projectivities.

Mathématique. — BOTTEMA, O.: *La figure de quatre plans en R_5* . I, p. 30.

On ne peut pas toujours caractériser la figure de quatre plans dans l'espace à cinq dimensions par ses invariants; il est possible pourtant de trouver tous les cas spéciaux à l'aide de la théorie des facteurs élémentaires. On a six types: A. les plans ont trois transversales; B. il y a une transversale simple et une transversale double; C. on a une transversale isolée et ∞^1 transversales, situées dans un espace à trois dimensions, etc. Il y a toujours une Vierergruppe de transformations projectives pour laquelle une figure de quatre plans est invariante; il existe pourtant des quadruples spéciaux (du type A), dont les groupes automorphes comptent 8, 12 ou 24 transformations.

Botany. — WIERSUM, L. K.: *A method of passing water through the xylem-tracks in the root in view of the transport of substances in radial direction*, p. 38.

The two leading principles by which the absorption of substances by the roots is explained, show a certain discrepancy. This fact encouraged a study of the radial permeability of the living tissue of the root between xylem and outward medium by a new method. On this behalf cylinders of ample $6\frac{1}{2}$ cm long were cut out of the root hair zone of young roots, so that the xylem-tracts were opened at both ends. A flow of solution through the vessels of these pieces of root could be artificially originated by means of a partial vacuum after placing the roots in an apparatus, especially constructed for this purpose. The substances that were investigated could thus be sucked through the xylem in known hypotonic concentration and the transport across the coat of living tissue to the external solution could be followed up. By means of accumulation tests the normal behaviour of the root-tissue during the experiment was demonstrated.

For Ca which is usually considered as penetrating relatively badly, a transfer across the root-tissue could be observed. This must be due to diffusion as blocking of the respiration had no effect. A second substance which was investigated was saccharose, which also passed through the