

erkennen lassen oder einem Partner der Chimäre überhaupt fehlen. Mit anderen Worten: Die Formvergleichung hat Grenzen, über die die entwicklungsphysiologische Methode hinausführt.

Die letztere ergab in der Embryonalentwicklung von «Ordnungschimären» ein bemerkenswertes Zusammenspiel art- oder ordnungsbegrenzter und gemeinsamer Teilvorgänge. Sie zeigte, dass auch bei divergenter Entwicklung ein Grundstock von Gemeinsamkeiten vorhanden ist¹, und dass eine unerwartete gegenseitige Substituierbarkeit des geweblichen Materials möglich ist. Auf die Stammesgeschichte zurückprojiziert bedeutet dies, dass bei evolutivem Geschehen eine grosse Plastizität und Kombinierbarkeit von Teilvorgängen angenommen werden kann. Dies vermindert bis zu einem gewissen Grad die Schwierigkeiten, denen wir bei der stammesgeschichtlichen Entstehung stark abweichender neuer Typen begegnen.

Summary

The present paper deals with xenoplastic transplantations between germs of *Triton* and *Bombinator*; transplant and host belong to different Amphibian orders. These transplants have developed into the following larval organs:—

- (1) functional Bombinator-labyrinths in Triton-host (ANDRES 1949, 1950);

¹ Vgl. auch F. E. LEHMANN, Vjschr. Naturf. Ges. Zürich 83, 187 (1938), (Festschrift KARL HESCHELER).

- (2) suckers of *Bombinator* in Triton-host, chimeric Tritonbalancers in *Bombinator* and in *Triton* (CHEN-BALTZER 1951, CHEN 1952);
- (3) chimeric teeth: enamel organ from *Triton*, dentine papilla from *Bombinator* (WAGNER 1949);
- (4) chimeric or pure visceral arches of *Bombinator* in *Triton* head (WAGNER 1949).

The important result is the fact that the cell material of *Bombinator* participates in the formation of Triton-specific organs, which are not present in *Bombinator*. Moreover a similar combined development occurs in organs, which are, if at all, only partially homologous in the two Amphibian types. Such findings may contribute to an experimental analysis of the developmental background of homologies (BALTZER 1950). In this respect the experimental facts provide indications which the pure morphological comparison is not able to give: namely, in two points.

(a) It is well known that inductions are non-specific. Moreover, non-equivalent induction-processes may be substituted for one another between the two Amphibian groups (case of sucker induction in the *Bombinator* gastrula and the *Triton* neurula, CHEN 1952).

(b) It is not surprising that the cell material and the organ-primordia can mutually replace each other in the development of homologous organs (Bombinator-labyrinths in *Triton* [ANDRES, l.c.], *Bombinator* neural cord in *Triton* and vice versa, ROTH, 1950). However, it is unexpected that similar replacements can also occur in cases where no homology, or at best a partial one, exists (cases 2–4 enumerated above).

Ultimately these findings contribute to phylogenetic conceptions. Substitutions and replacements as described above suggest a very great plasticity in phylogenetic changes.

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The Diffuse X-Ray Reflections from Diamond

It has been known for some years that in addition to the usual X-ray diffraction spectra diamonds may give diffuse reflections of two types. One type is always observed, namely, that which is attributed to thermal diffuse scattering, but the other does not occur in all crystals and is qualitatively different from the thermal type. On a Laue photograph the thermal type of scattering gives rise to spots having diffuse boundaries, whereas the second type is associated with sharp extra spots. The sharp spots occur in positions on the photograph corresponding to the intersection with the reflecting sphere of spikes passing through each relp (reciprocal

lattice point) and parallel to the edges of the unit cell. Certain rules have been established concerning their presence or absence¹.

From Laue photographs taken with various radiations we have studied (a) the occurrence of spikes for a number of relps, (b) the law of variation of the scattering density along any given spike, (c) the relative intensities of the various spikes, and (d) the absolute intensity of one spike for one crystal. Our results show that the scatter-

¹ C. V. RAMAN and P. NILAKANTAN, Proc. Ind. Acad. Sci. [A] 14, 356 (1941). – K. LONSDALE, Proc. roy. Soc. [A] 179, 315 (1942). – A. GUINIER, Bull. Soc. franç. Min. 67, 382 (1944). – H. GRENVILLE WELLS (Thesis, London 1951).

ing density along a spike in reciprocal space, $\mathcal{D}$, depends on the structure amplitude of the relp F_{hkl} and the distance from the relp, R , according to the expression,

$$\mathcal{D} \sim |F_{hkl}|^2 R^{-n}$$

where $n = 2.2 \pm 0.1$. The same value of n was obtained for all the spikes of all the relps investigated, namely, 111, 220, 311, and 331. The results concerning the occurrence and relative intensities of the spikes are contained in the following Table.

Indices of relp	Zone indices of spike			X-radiation used
	[100]	[010]	[001]	
111	87	87	87	Cu K α
220	76	76	absent	Cu K α
113	100	100	absent	Cu K α
222	~ 75	~ 75	~ 75	Cu K α
004	< 5	< 5	~ 30	Cu K α monochr.
331	7	7	104	Cu K α
224	72	72	30	Cu K β
115	present	present	absent	Mo K α monochr.
333	absent	absent	absent	Mo K α monochr.

The numbers given in the Table were obtained by dividing $\mathcal{D}$ at unit distance from the corresponding relp by the $|F_{hkl}|^2$ values given by BRILL *et al.*¹ The photographs were taken so that there appeared on the same film the spikes associated with different relps. In this way a comparison between the intensities of the spikes could readily be made. The spikes obtained only with Mo K α radiation were too weak to express numerically. The accuracy of the Figures is about 10%.

It will be seen from the Table that a simple relation exists between the indices of the relps and $\mathcal{D}/|F_{hkl}|^2$. Thus when h has a given value, no matter what the values of k and l may be, the value of $\mathcal{D}/|F_{hkl}|^2$ for the spike [100] is the same. For instance, when h has the values 0, 1, 2, 3, and 4, these values are < 5 , 100, 74, 5, and 30 respectively. The only significant departure from this statement occurs for the relp 111, but this may not be a true exception because the value of F_{111} given by BRILL *et al.* is possibly too high. The symmetry of the crystal requires that similar statements can be made about the relations between indices h , l and the spikes parallel to [010] and [001].

The absolute measurements can only relate to a particular crystal since the spikes occur with varying strengths in different crystals. The crystal used in this work was nearly spherical, of diameter about 0.5 mm and showed strong spikes. The absolute measurement was made by comparing the spike with the thermal diffuse spot. Taking the known values for the elastic constants of diamond it is possible to calculate from the usual formulae the absolute intensity of the thermal diffuse scattering for any given line passing through any relp. A comparison of the spike with the diffuse spot then puts the spike intensity on an absolute scale. The diffuse beam corresponding to the spike parallel to [100] passing through the relp 113 was studied. At a distance of $a^*/10$ from the relp the ratio of the diffuse and incident beams was 7×10^{-7} .

The above information expresses in quantitative form what previous authors have largely given in qualitative

form. The relation between the value of the index h and the intensity of the corresponding spike determines certain features of a stratification parallel to the cube faces. The inverse square law which we have found to be approximately valid would be expected to hold if this stratification is subject to random variations. Further work is in progress on the interpretation of these results.

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J. HOERNI and W. A. WOOSTER

Crystallographic Laboratory, Cavendish Laboratory, Cambridge, April 24, 1952.

Résumé

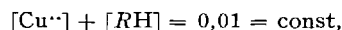
La diffraction des rayons X par certains diamants présente des réflexions anormales que nous avons étudiées quantitativement. Elles correspondent, dans l'espace réciproque, à l'intersection de la sphère d'EWALD par des zones de diffusion passant par les points du réseau réciproque du cristal, et sont dirigées selon les axes quaternaires. Les résultats obtenus fournissent une relation simple entre les intensités des diverses zones de réflexion diffuse.

Zur Kenntnis des Isonikotinsäurehydrazid-Cu-Komplexes

*Metallionen und biologische Wirkung, 9. Mitteilung*¹

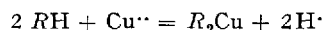
Das für die Chemotherapie wichtig gewordene Isonikotinsäurehydrazid bildet, wie bereits berichtet wurde², mit Cu⁺⁺ einen Komplex, der in Gegenwart von SO₄²⁻ als schwerlösliches Salz isoliert werden kann. Da, wie wir fanden, die Wirkung des Isonikotinsäurehydrazids auf Tbc-Kulturen im Kirchner-Milieu durch Zusatz von Cu⁺⁺ bis auf das zehnfache gesteigert werden kann, und andererseits die Verhältnisse im isolierbaren Festkörper nicht für die Deutung der in der Lösung vorhandenen Komplexe verwertbar sind, war es von Interesse, die Reaktion zwischen Isonikotinsäurehydrazid und Cu⁺⁺ in verdünnter wässriger Lösung näher zu charakterisieren.

Wir haben durch spektrophotometrische Absorptionsmessungen bei 760 μ von Isonikotinsäurehydrazid-CuSO₄-Mischlösungen die Komplexbildung untersucht. Bei Variation des Konzentrationsverhältnisses, so dass



zeigte es sich, dass ein Komplex gebildet wird, in dem 2 Mol Isonikotinsäurehydrazid auf 1 Mol Cu⁺⁺ enthalten sind.

Die Frage, ob es sich hier um einen einfachen Ion-Dipolkomplex handelt oder ob Isonikotinsäurehydrazid in der tautomeren Form als Pseudosäure reagiert:



konnte durch Ermittlung der die Reaktion begleitenden Änderung der $[\text{H}^+]$ entschieden werden. Die Messungen zeigen, dass H⁺-Ionen frei werden, so dass ein Komplex von der Formel (I) in der Lösung anzunehmen ist.

¹ 8. Mitteilung: V. KOCHER und E. SORKIN, *Helv. chim. acta* **35**, Fasc. 5 (1952).

² E. SORKIN, H. ROTH und H. ERLNMEYER, *Helv. chim. acta* **35**, Fasc. 5 (1952).

¹ R. BRILL, H. G. GRIMM, C. HERMANN, and C. PETERS, *Ann. Phys., Leipzig* **34**, No. 5, 393 (1939).