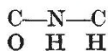


The differentiation-enhancing compounds are first, *d*-glutamic acid and its homologue *l*-aspartic, *l*-proline and *l*-hydroxyproline. The members of this group are interconvertible through pyrrolidone carboxylic acid, a common intermediary^{2,3}. Then there is tyrosine, from which melanin is formed by tyrosinase through compounds identified as carrying the benzopyrrole ring⁴. Finally, differentiation is advanced by cytosine and thymine, two nucleic acid derivatives which carry the carbonyl-imid-methine sequence in heterocyclic configuration similar to pyrrolidone⁵.



It is clear that the group of differentiation-forwarding compounds is united by the common possession of a potentiality for yielding a single and unique type of chemical configuration. The association is too close-knit to be fortuitous.

The assumption is therefore justified that in the pyrrolidone configuration or some part or derivative thereof is to be found that chemical constellation

which is a specific determinant and participant in some phase of that chemical specialization which is differentiation, and through which cells are brought to their characterizing functional and structural maturity.

The possible significance of this to neoplasia is clear—for through the application of the principle it is possible that cancer cells may be brought to maturity—if they can be so brought—and thus the lethal aspects of this growth be diverted. Work in this direction will be carried out.

FREDERICK S. HAMMETT.

Marine Experimental Station,
Lakenau Hospital Research Institute,
North Truro, Massachusetts.

¹ Occasional publications of the American Association for the Advancement of Science, No. 4. June 1937. Pp. 167-172.

² Mitchell and Hamilton, "The Biochemistry of the Amino acids" (Chem. Catalog Co., New York, 1929).

³ Well-Malherbe and Krebs, *Biochem. J.*, **29**, 2077 (1935).

⁴ Richter's "Organic Chemistry", **3** (Nordeman, N.Y., 1923).

⁵ Levene and Bass, "Nucleic Acids" (Chem. Catalog Co., New York, 1931).

Points from Foregoing Letters

DR. P. KAPITZA describes new experiments from which he deduces that the viscosity of helium II (below the λ -point) is at least 1,500 times more than that of helium I at normal pressure, which may account for the abnormally high heat conductivity of helium II. He suggests that helium, below the λ -point, enters a special state that may be called super fluid. Further experiments are reported by J. F. Allen and A. D. Misener indicating that the flow of helium II at 1° K. does not follow the ordinary equation for laminar or turbulent motion. The authors consider that the type of motion observed might arise from slipping of helium II over the surface of the tube, in which case the flow method would not be likely to give a value of the viscosity which had much meaning, and that undamped turbulent motion cannot account for an appreciable part of the high thermal conductivity observed.

The potential difference between the end of a tin wire at the transition temperature (of supraconductivity) according to Dr. F. B. Silsbee, Dr. F. G. Brickwedde and R. B. Scott, contains a component of double the frequency of the alternating current (200 kc./sec.), when the last-mentioned is superposed upon a direct current, so that the resulting magnetic field at the surface of the wire is caused to pulsate cyclically.

Prof. A. Softan and Prof. L. Wertenstein have found that the ratio of formation of the two radio-isotopes of bromine with half-lives 18 min. and 250 min. which, according to recent views, are considered as representing two isomeric forms of the nucleus ⁸⁰Br, is distinctly different when the radioactivity is excited with fast (up to 14×10^6 ev.) and slow (thermal and resonance) neutrons. This ratio is equal in the first case to 0.56 and in the second case to 2.

By injecting 'labelled' sodium phosphate into the tail vein of six normal and six rachitic rats, Dr. M. J. L. Dols and Prof. B. C. P. Jansen, in collaboration with Prof. G. J. Sizoo and F. Barendregt found that within half an hour a considerable amount of the inorganic phosphorus injected had been transformed into organic phosphorus of lipins. The blood figures confirmed their previous results; within half an

hour after the injection, the active phosphorus had, for the most part, disappeared from the blood. Significant differences between normal and rachitic rats could not be established.

From changes observed since 1923, Dr. W. R. G. Atkins points out that the relation between phosphate concentration and the abundance of plankton in the water of the English Channel is well established. He suggests that there is also a connexion between the abnormal movement of large masses of water from the Atlantic Ocean to the Channel and the change in the amount of radiation from the sun.

Miss Ruth Deanesly reports that castration of young male dwarf mice does not enlarge the 'X-zone' of the adrenal, a region of small, darkly stained, lipid-free cells, found in the adrenal cortex of normal female mice, and also developing in normal castrated mice, unless counteracted by injections of male sex hormone. The new experiments indicate that the development of the 'X-zone' is not controlled solely by secretion of the gonads but may be dependent upon some secretion of the pituitary in which the dwarf males are deficient.

H. N. Barber reports that chromatid bridges are induced by ageing in the second postmeiotic mitosis of pollen of *Paeonia* and *Kniphofia* species. They are probably formed by union of the homologous ends of the sister chromatids derived by division from one parent chromosome.

Prof. A. Rubinowicz notices that Prof. Sekiguti's identification of the coronal line λ 4815.9 with the nebular line λ 4814.78 in the spectrum of η -Carinae would indicate the occurrence of iron in the solar corona. Although this identification appears to be partially justifiable, certainly further evidence for its support is needed. Prof. F. J. M. Stratton also discusses this identification.

Dr. S. Dobinski finds that the concentration of alloying elements in the neighbourhood of the surface is governed by the surface tension of the constituents and differs in most cases considerably from the average composition of the material. Electron diffraction experiments on some copper alloys confirm this view.