considered the polymerization factor. Uhlmann[30] has suggested that an isotopic fractionation occurs in the sublimation of ice and snow, which would mean that our aged ice samples contained more deuterium than the condensed water; and the first biological experiments[31] with heavy water showed that a concentration slightly higher than that in "ordinary" water (if there is such a substance) has a beneficial effect on *Spirogyra*.

The term "trihydrol" has been used for the highest polymer, but this may be an aggregate of as many as twenty-three molecules,[32] hexahydrol,[33] a quartz-like structure,[34] or a doublet of the pyramidal anion H_3O_2 with the hydrogen ion.[35] Since the polymers differ in density (Sutherland calculates the density of trihydrol as 0.88) separation might be effected by other methods. Berkeley[36] has suggested centrifugal force for the separation of isotopes and polymers, and perhaps ultracentrifuges like those of Svedberg[37] or Beams and Pickels[38] will ultimately develop fields of sufficient magnitude.

The conclusion appears to be that, although ice water and steam water have different biological effects, a good deal more information is needed on the physical side before definite rôles can be assigned to the many forms of water in living matter.

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A POSSIBLE EXPLANATION OF THE FUNCTION OF GLUTATHIONE IN DEVELOPMENTAL GROWTH

FOR the past two and a half years I have been studying the developmental reaction of *Obelia geniculata* to the naturally occurring tissue "Bausteine." Since some time must elapse before the data as a whole will be published, I am reporting the essence of the results with the three amino-acids of which glutathione is composed. These results derive from observation of the development of some thousands of animals under conditions described in previous papers. As has been told in many reports, the chief function of cystine or cysteine, its reduced form, in developmental growth is acceleration of cell multiplication. This derives from the SH group potentially or actually contained therein. Glycine, a second of the amino-acids of glutathione, has now been found to favor the regeneration of new hydranths from broken pedicels. No other amino-acid does this specifically. The finding suggests that glycine is concerned in the protein reconstitution essential for regeneration. It is perhaps a scientific demonstration of why gelatin with its high glycine content has been popularly supposed to be particularly useful as an article of diet in convalescence from wasting disease. It is consistent with the recent reports in medical literature that in some cases glycine is apparently of benefit in rebuilding muscle tissue. The third amino-acid of glutathione is glutamic acid. And this decidedly and definitely favors the process of differentiation and consequent organization. No other amino-acid yields like effect to like degree. It is this amino-acid which shows as its outstanding and specific influence upon developmental growth the acceleration of differentiation and consequent organization.

Thus, then, it seems as if in glutathione nature has developed in one and the same chemical compound a complex which conditions if it does not determine the course of the several basic and essential processes concerned in developmental growth. Through cysteine it accelerates cell proliferation, the first step; through glycine it accelerates that protein reconstitution which is an essential accompaniment to both cell division and cellular differentiation; and through glutamic acid it accelerates the progress of that selective building-up of the protein molecule which is the characterizing process of differentiation and its consequent organization.

There are those who deprecatingly insinuate that reports of what happens under certain conditions are of little value without explanations of the mechanism producing the given reaction. It takes but little clear thinking to realize that the first step in scientific inquiry is to find out what happens. Only when this has been done can there be found out how it happens. The why is so frequently a subject of metaphysics that it need not be discussed here.

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SCIENTIFIC APPARATUS AND LABORATORY METHODS

A METHOD FOR DESTROYING INTERNAL CELL MASSES

THE problem of destroying internal cell masses with a minimal destruction of the intervening layers of tissues has arisen in a number of different fields of research. Most of the techniques thus far devised have certain limitations which obviate their use in investigations where a precise control over the amount

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