shown that chloracetyl-, bromacetyl- and iodoacetyl-leucine under the influence of acylase behave similarly to the corresponding tyrosine compounds.

Glick[3], in studies on the specificity of choline esterase, has shown that halogenation of the acid component of acetylcholine increases the velocity of the catalysed reaction. He has also shown that halogenation of both radicals of ethylacetate considerably increases the velocity of the enzymatically catalysed reaction. Commenting on the fact that acetylcholine and chlorethylacetate are split at approximately the same speed, he states that it is peculiar that replacement of the positively polar methylamino group by the negatively polar Cl atom should not influence the reaction velocity. The fact that both these groups are electron attracting groups and exert negative inductive effects on the atoms of the link split explains this apparent anomaly. These examples from Glick's work also show the influence of substrate polarity on the velocity of enzyme action.

That substrate polarity is a factor determining quantitative enzyme specificity is clear from the marked effect which it has on the reaction velocity. Whether substrate polarity can be regarded as a factor determining absolute specificity remains to be seen.

Up to the present there have been many references in the literature to the importance of molecular polarity in biochemistry without any very clear reasons being given. When the influence of polarity on both the uncatalysed reaction (*cf.* Hinshelwood *et al.*[4]) and on the catalysed reaction is borne in mind the significance of this factor becomes clear. For example, changes in the polarity of a drug or other compound can effect its solubility, the rate and magnitude of its action and the rate at which it is destroyed whether enzymatically or otherwise.

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Influence of Cell Wall Composition on the Moisture Relations of Hardwood Timbers

IT has already been shown that the compressive strength of hardwood timbers in the green condition is dependent on the degree of lignification as revealed by the behaviour of thin sections with micro-reagents. Thus tropical timbers, with their greater degree of lignification, are on the average stronger than temperate zone timbers of similar density, and the normal wood of temperate zone hardwoods is stronger than tension wood from leaning trees of the same species[1]. The difference in strength between normal and tension wood was found to be less pronounced in air-dry than in green wood[1], and this observation suggested that the influence of the degree of lignification is affected by the moisture content of the wood. In order to examine this possibility a scrutiny has been made of data in the records of this Laboratory or published by other institutions[2,3,4]. The data were taken as a whole, without the exclusion of particular species, and a comparison was made (*a*) between tropical and temperate zone timbers, and (*b*) between normal and tension wood, the influence of density being taken into consideration. In so far as differences in cell wall composition account for the differences between the properties of the timbers under comparison, our observations indicate that the proportional increase in strength which usually accompanies the drying of wood is less in strongly lignified than in weakly lignified material, and consequently differences in strength which are due to differing degrees of lignification tend to be reduced as wood dries. This provides a partial explanation of the fact that the relationship between compressive strength and density is much closer in air-dry than in green wood, particularly in the case of temperate zone timbers.

It was further observed that tropical timbers show a slightly, but significantly, smaller shrinkage both radially and tangentially than temperate zone timbers ; they have on the average a lower fibre saturation point (as determined from measurements of shrinkage in drying wood), and reach equilibrium at a lower moisture content when placed in an atmosphere of 90 per cent relative humidity. At 60 per cent relative humidity, however, there is no significant difference between the equilibrium moisture contents of the two groups of timbers.

The data available for the comparison of normal wood with tension wood are very limited in amount, but so far as they go they appear to indicate a behaviour parallel to that of the tropical and temperate zone timbers. The only difference of note is that in two of the three species examined the normal wood showed a slightly *higher* equilibrium moisture content at 90 per cent relative humidity than the tension wood ; in the third species no difference was detected. In view of the small number of samples available, however, this point requires further investigation.

It is thus apparent that the equilibrium moisture content, the shrinkage in passing from the green to the air-dry state, and the strength-density ratio in hardwood timbers are all dependent to some extent on the degree of lignification. The influence of the degree of lignification on strength, however, appears itself to be dependent on the moisture content. It is of practical significance that variation of certain properties tends to be reduced as wood dries from the green state to the condition in which it is ordinarily used.

Details of the investigation are contained in Project 18, Progress Report No. 11, copies of which will be obtainable from this Laboratory.

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