Concerning the Supposed Absorption of Ultraviolet Energy by the Peptide Linkage

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Gelatin, which contains only traces of tyrosine and no tryptophane exhibits a small but definite absorption band near 2800 Å, which is shifted towards the red in alkaline solution. This band which has also been found in egg albumin, has been ascribed to peptide bonds by Anslow and Nassar¹. The evidence is considered insufficient by Crammer and Neuberger, however². In view of the importance of this subject to the problem of the photochemistry of proteins³, clupein, a polypeptide of molecular weight ca. 4000⁴, which lacks aromatic amino acid residues, has been examined.

In Fig 1, the lower curve is that of an aqueous solution containing 1.25 % clupein at pH 7 for a 1 cm path length, as obtained with a Beckman spectrophotometer. The wavelength is plotted in Ångström units and the ordinate is optical density as usually defined. The upper curve is for a solution of the same concentration at ca. pH 12 as read against an aqueous solution of 0.06 N sodium hydroxide. The middle curve is for a solution of the same concentration of clupein and at a pH ca. 10.5.

These data show that there is no specific absorption of peptide bonds at 2800 Å and confirm the fact that no aromatic

Fig. 1. Ultraviolet absorption spectrum of clupein chloride.

amino acids are present in clupein. At the higher pH only about half the guanidine groups of the arginine residues are ionized which may account for the difference in absorption as compared with the solution at pH 7.

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