It is realized that the gap in the knowledge of the life-history of *P. umbilicalis* is still not completely bridged, and an attempt is being made to follow the development of the very curious so-called sporangia of the *Conchocelis*-phase. These may give rise to further *Conchocelis* or leafy *Porphyra* thalli, but so far sterile shells put in beakers containing well-developed *Conchocelis* remain uninfected by it. Even when the life-history is completely known, the full implications of the existence of this *Conchocelis*-phase cannot be assessed without the cytological evidence, and this side of the investigation has also been started. Dangeard¹³ considered that reduction division takes place immediately after fertilization, and if this is so, the existence of the *Conchocelis*-phase is all the more interesting.

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Vibration of the Flagellum of the Ant Antennæ

IN May 1949, a series of photographs of ants of the species *Formica rufa*, Latr., were taken by Raymond Kleboe of *Picture Post*, in collaboration with me, and in many of these worker ants were shown. The ants were usually in a posture of defence; but whether they were defending the nest, attacking prey, or merely hurrying over the surface of the nest or the roads which surround it, the flagella of the antennæ were indistinctly shown in the photographs. The photographs concerned were taken at 1/500–1/1,000 sec.

All the rest of the bodies of these ants were clearly shown, only the flagella being indistinct. These organs, which are thought to have an olfactory function, would seem to be vibrating so rapidly that a camera capable of taking exposures of 1/500 sec. was not able to capture in many cases even a semblance of stillness and clarity. Such movement should, of course, be distinguished from the coarser rotations of the flagella, which are clearly visible to the naked eye.

It is difficult to suggest what functional value such rapid vibration of sensory organs may have, although it would seem that it must be intimately connected with the very high degree of development of the olfactory sense in ants.

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Quantum Yields for Photolysis of the Peptide Bond at 2537 Å.

FROM a study of the action of ultra-violet light on monolayers of proteins, Mitchell¹ suggested that tyrosine absorption leads to breakage of the —CONH— bond adjacent to the chromophore. According to Pauling and Niemann² the C—N linkage has the lowest bond energy and should, therefore, be the first to break when energy is supplied to the molecule. Mitchell's model experiments for proteins with stearyl anilide suffer from the drawback that the phenyl group is directly adjacent to the —CONH— link, but Carpenter³ has shown that, with benzyl stearyl amine and β-phenyl ethyl stearyl amine, cleavage also occurs where the benzene ring and the —CONH— linkage are separated by one or two —CH₂— groups.

Since the fragments left by such photolytic cleavage might give valuable clues to the sequence of amino-acids in a protein, it was worth while to investigate the quantum efficiencies of isomeric peptides with the chromophore on opposite sides of the —CONH— bond. A comparison of the action of ultra-violet light (2537 Å.) on leucyl-tyrosine and tyrosyl-leucine at different pH's was thought suitable, but irradiation under a constant stream of nitrogen showed that no free amino-acids could be detected by the sensitive and specific methods of Van Slyke *et al.*⁴. Although these results contradict a report by Carpenter⁵, they are not inconsistent with the findings of earlier investigators⁶. In particular, Guillaume and Tanret did not observe any hydrolysis of the related glycyl-tyrosine after irradiating the solutions for 12 hr. More recently, Weizmann *et al.*⁷ found that alanyl-glycine was deaminated like amino-acids, and concluded that relatively no photolysis of the peptide bond takes place whenever free terminal amino-groups are available. Whether such preferential deamination or secondary reactions leading to decomposition of the amino-acids as soon as formed are the cause, photolysis of the dipeptides yielded ammonia but no free amino-acids.

A pair of compounds not containing free terminal amino-groups was considered more desirable for study, since Allen *et al.*⁸ and also Levy⁹ had shown that acylated amino-acids and peptides are indeed cleaved at the —CONH— bond; also any ammonia produced by photolysis of such hemipeptides must be derived by splitting of the peptide bond. Phenyl-propionyl-alanine and propionyl-phenylalanine were selected to determine whether a preferential transfer of energy in any one direction would take place. Three series of experiments under nitrogen, under oxygen and in air with constant stirring were set up. In all cases M/100 solutions, absorbing more than 99 per cent at 2537 Å. and having a pH c. 3, were irradiated. Details of radiation procedures are given elsewhere¹⁰. The results, shown in the table, show that under nitrogen, within 10 per cent, the energy absorbed by the chromophore is transmitted to the weakest bond, the C—N link of the peptide group, at equal efficiency through 3 C or 2 C and 1 N atom.

This fact may have an important bearing on structure determinations by analysis of fragments obtained by the photolysis of proteins. Somewhat higher quantum yields were obtained in the case of phenylpropionyl-alanine, which yielded small amounts of alanine as well as ammonia. No free phenylalanine was found in the irradiated propionyl-phenylalanine solutions, and quantum yields were