zen einem lichtabhängigem Mechanismus zuzuschreiben ist. Es wird vermutet, dass die spezielle Kultivierungsmethode unter Blitzlichtbedingungen es ermöglicht, die Induktion der photosynthetischen Aktivität von der Aktion derselben zu trennen. Noch können wir kein Wirkungsspektrum dieser Induktionsreaktion angeben, welche das inaktive PS-II in einen aktiven Zustand überführt. Da die Kinetik der Induktion von der Temperatur abhängig ist und im Dunkeln sich langsam rückläufig verhält, vermuten wir photoenzymatische Reaktionsmechanismen.

Aus den vorliegenden Daten ziehen wir folgende Schlussfolgerungen: Ein aktives PS-II benötigt mindestens zwei prinzipiell verschiedene Lichtmechanismen. 1. einen Lichtmechanismus, welcher das Gleichgewicht zwischen potentiell aktivem und inaktivem PS-II zu Gunsten der aktiven Form verlagert, also eine Regulatorfunktion ausübt. 2. Einen Lichtmechanismus, welcher für die PS-II-Aktivität verantwortlich ist[9].

Lichtquanten, welche den Induktionsmechanismus auslösen, tragen somit nicht direkt zur Wasserspaltung bei, sind aber notwendig, damit das PS-II dauernd in einem sensiblen Zustand gehalten wird, welcher bei Anregung durch weitere photosynthetisch wirksame Photonen die Sauerstoffentwicklung ermöglicht. Ein aktives Photosystem II würde sich somit aus einem lichtabhängigen Regulationsmechanismus und einem lichtabhängigen Sauerstoff entwickelnden Mechanismus zusammensetzen[10].

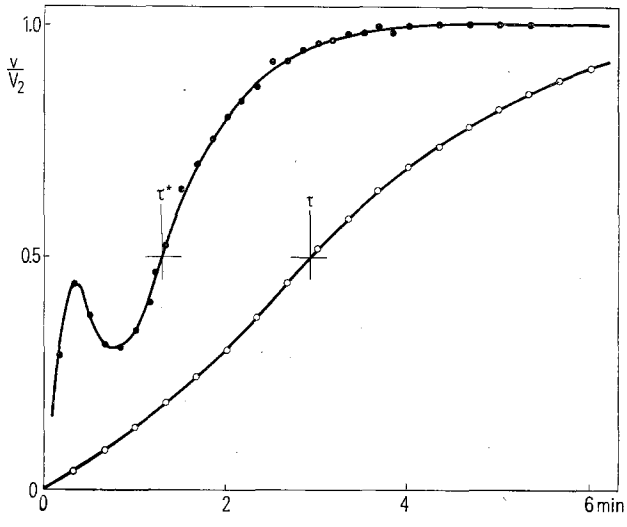

Fig. 3. Relative Sauerstoffproduktionsraten von Bohnenblättern, welche unter Blitzlichtbedingungen kultiviert wurden, während ihrer ersten Belichtung mit $I_2 = 4 \times 10^4$ erg/cm²/sec. ○, ohne Vorbelichtung; ●, mit 6 min Vorbelichtung mit $I_2/20$; τ^*, τ, notwendige Zeit für 50% Induktionsgrad.

Summary. Beans grown under a flash regime never show a PS-II activity at their first illumination with photosynthetically actinic light. But immediately when light is on, an induction period takes place for some 6 min. In this paper we show, by oxygen measurements and different light conditions, that the induction of PS-II activity is due to a photosynthetically independent light reaction.

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Changes in the Ultrastructure of Erythrocyte Membrane Subjected to UV-Irradiation in vitro

Some studies of the last years indicate that metabolic activity of erythrocytes is closely connected to their structure[1,2]. The defined physiological activities of these cells depend not only on their shape but also on the specific ultrastructure of the membrane[3,4]. UV-irradiation, acting on enzymes and other proteins and on adenyl nucleotides and other phosphate esters, influences energy metabolism of erythrocytes, which is responsible for maintenance of the normal structure and function of the cell[5,6]. Irradiation also affects membrane permeability, erythrocyte volume and ultrastructure of the membrane[5–7].

Introduction of electron microscope techniques gave a new approach to the studies on erythrocyte structure[1,8–10]. Electron microscope methods allow the observation of the surface structures of the red blood cell and demonstrate a relation between these structures and activity of metabolic processes of erythrocytes[11–13].

Material and methods. The study material consisted of pig, bovine and human blood, which have different ADP, ATP and 2, 3-DPG levels. Blood was irradiated for 300 min in silica cuvettes with UV-rays, using Hanau S-500 lamp with efficiency 4.34×10^8 erg/sec in the range of 248 nm–436 nm[14].

Erythrocyte membranes were obtained by the method of Dawson and Elford[15], modified by Taylor and Kwiatkowski[16]. For further studies of membranes, the negative staining method of Brenner and Horne[17] was used.

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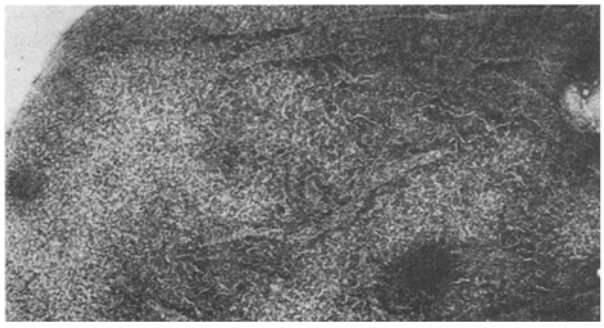

Fig. 1. Control bovine erythrocyte membrane, negatively stained with phosphotungstic acid. ×15,000.

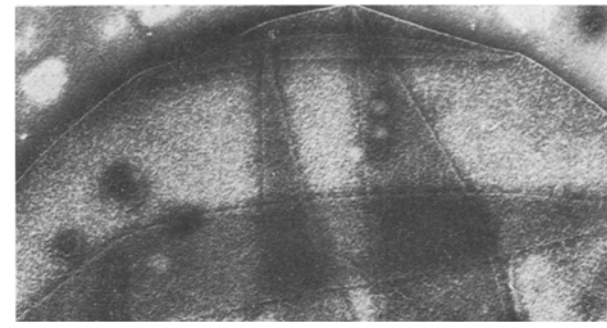

Fig. 2. Bovine erythrocyte membrane, negatively stained with phosphotungstic acid. Blood irradiated for 300 min with UV-rays. ×15,000.

Results and discussion. The detailed fine structure of erythrocyte membrane is very similar in the case of pig, bovine and human erythrocytes. The results obtained for non-irradiated membranes are in agreement with the results of DANON and PERK[3].

The membranes have a fine granular structure, the rather thick folds are localised mainly in peripheric areas of the object. After UV-irradiation, erythrocyte membranes are always thinner, the surface structure is less granular and the folds appear chiefly in the central areas. These changes may be related to changes of membrane permeability, following UV-irradiation.

The fine structure of erythrocyte membrane, although similar, is not identical for the species investigated. It seems that the size of the granules may be correlated to ATP level and osmotic propreties of the cell[5,6,14].

The results obtained by the negative staining method seem to confirm the differences in the ultrastructure of membranes of the different animals. We observed several conal-like and thread-like structures, and also pit structures, observed by HARRIS and AGUTTER[18]. After UV-irradiation, the number of thread-like structures is much smaller; sometimes they disappear completely.

Our results suggest that erythrocyte membranes, subjected to UV-irradiation, are less granular, smoother, thinner and take the appearance of old erythrocytes or erythrocytes with enzymatic defects, e.g. with the defficiency of glucose-6-phosphate dehydrogenase (G-6-PD)[19] or erythrocytes with decreased metabolic activity[12,13,20,21]. The suggestion is only preliminary one and needs further investigation.

Résumé. Nous avons étudié l'effet des rayons UV sur l'ultrastructure des globules rouges des mammifères. L'examen électronoscopique montre qu'après ce rayonnement la membrane des globules rouges devient moins granulaire et moins épaisse. La répartition de ses plis ressemble à celle que présentent les globules plus vieux ou atteints de défauts enzymatiques (p. ex. le manque de G-6-PD).

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Evidence that Pepsitensin is Angiotensin I

FERNANDEZ et al.[1] obtained a highly purified pepsitensin[2] from ox plasma incubated with pepsin at pH 6.0, and identified it as the decapeptide angiotensin I. More recently, however, HOCHSTRASSER et al.[3] isolated a pepsitensin from denatured renin-substrate treated with pepsin at pH 3.0 and concluded that it was the undecapeptide angiotensin I-yl-leucine. These results would suggest that pepsin might act at a different peptide bond in plasma renin-substrate, according to the pH of incubation: either the Leu^{10}-Leu^{11} or the Leu^{11}-Val^{12} bond would be broken at pH 6 of pH 3, respectively. In order to verify this hypothesis we have identified the products of the peptic proteolysis of synthetic tetradecapeptide renin-substrate by pepsin, at both pH 6 and pH 3.

Materials. The tetradecapeptide renin-substrate was a product of Schwarz/Mann, Orangeburg, New York. It had

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