crinoids are the first echinoderms to appear in the fossil record, all echinoderms may ultimately have evolved from a now extinct crinoid. The presence of quinone pigments in crinoid limestone has been demonstrated[19], but it is interesting to note that the modern comatulid crinoids are apparently the only echinoderms which synthesize anthraquinones[11,12,20].

Zusammenfassung. Das Vorkommen chinonoider Pigmente bei allen Echinodermen deutet auf eine Beziehung zwischen Seeigeln und Schlangensternen, ebenso zwischen Seesternen und Seewalzen hin. Die Verteilung der Sterine und der Saponine weisen in dieselbe Richtung. Die klassische embryologische Theorie stützt diese Verwandtschaftsauffassung.

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Circulating Plasma Kinin in Patients with Bronchial Asthma

Biologically active polypeptides, plasma kinins, have been considered to play a role in the pathogenesis of various clinical conditions, such as hereditary angioneurotic oedema[1], pancreatitis[2], or carcinoid syndrome[3]. According to COLLIER and his co-workers[4], bradykinin given i.v. to the guinea-pig increased the resistance of the lung to inflation. In the studies on asthmatic patients, HERXHEIMER[5] observed a decrease in the vital capacity and appearance of audible wheezing after the inhalation of bradykinin aerosol, while no changes were found in normal persons. However, these results are not direct evidence that bradykinin plays an actual role in asthmatic patients.

Recently, we developed a new method for determining the kinin content in peripheral blood[6]. With this method, blood kinin levels in asthmatic patients were determined and hitherto unreported data, which give further evidence for the participation of kinin in the etiology of bronchial asthma, were obtained.

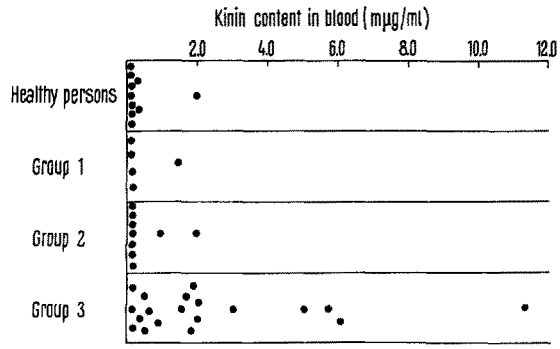
Patients. 10 healthy persons and 33 asthmatic patients were subjected to this study. The asthmatic patients were divided into 3 groups according to their clinical features, as follows: group 1 consisted of 5 patients in whom no complaints or clinical signs were recognized at the time of experiment. Group 2 consisted of 9 patients in whom wheezing and rhonchi were audible on auscultation, but dyspnea was not apparent. Group 3 consisted of 19 patients in whom wheezing was audible by the unaided ear. In this group, sibilant rales were heard on auscultation over all the lung field, and dyspnea was distinct, especially in the recumbent posture. Cyanosis was observed not infrequently.

Methods. A syringe and a needle were siliconized and kept in cold before use. 10 ml of venous blood were rapidly drawn from the antecubital vein into the syringe which contained ethylenediamine tetraacetic acid solution. The sample was immediately transferred to a centrifuge tube containing hydrochloric acid, and shaken sufficiently.

The mixed solution was adjusted to twice the volume with 20 ml of *n*-butanol. After the elimination of water in the butanol phase by adding 10 g of anhydrous sodium sulphate, the active substance was re-extracted twice with 4 ml and 2 ml of distilled water. The aqueous extract was concentrated around 0.6 ml under reduced pressure at below 40 °C. After neutralization, the final volume of the extract was adjusted to 2.0 ml with water. This solution was assayed on the isolated guinea-pig ileum suspended in a bath filled with Tyrode solution at 33–35 °C. Atropine sulphate (10^{-6}) and promethazine hydrochloride (10^{-7}) were added to Tyrode solution.

The active substance extracted by this method was thermostable and destroyed by the incubation with chymotrypsin. This substance also elicited the slow contraction on the isolated guinea-pig ileum and vasodilatation of a dog's femoral artery, and showed the same migration rate as that of synthetic kallidin of paper chromatography (butanol-acetic acid-water, 4:1:1 v/v). From these results, the extracted substance was tentatively identified as a kinin.

Results. The estimated values of blood kinin in healthy persons and asthmatic patients are shown in the Figure.



Kinin contents in peripheral venous blood in healthy persons and asthmatic patients.

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No kinin activity was detected in 9 healthy persons, and only 1 showed the value of 2 mμg/ml. In the asthmatic patients, various kinin contents were observed: no significant difference was found in the kinin levels between healthy persons and the patients belonging to the groups 1 and 2. In group 3, however, 5 cases showed extremely high values of blood kinin and the remaining 6 patients showed relatively higher kinin levels.

Mean values of kinin contents in each group were calculated; they were: 0.20 ± 0.60 (standard deviation) for healthy persons, 0.32 ± 0.66 for group 1, 0.33 ± 0.66 for group 2 and 2.9 ± 2.7 mμg/ml for group 3. Almost 10 times greater values than that for the normal group were found in group 3.

Our experiments have shown that the circulating plasma kinin is significantly increased in most patients with severe bronchial asthma. It was an interesting finding that higher contents of kinin were obtained in the more severe forms of asthma. These results strongly suggest that kinin release is somehow involved in bronchial asthma[7].

Zusammenfassung. Bei 33 Patienten mit Asthma bronchiale von verschiedenem Erkrankungsgrade wurde der Kiningehalt im zirkulierenden Blut bestimmt. Erhöhte Blutkininwerte wurden in den Patienten gefunden, und zwar im allgemeinen mit der Schwere der Krankheit korrelierbar. Daraus folgt, dass das «Kinin» aetiologisch mit Asthma bronchiale verknüpft ist.

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Relation of ATPase Activities to Iron Uptake in Rabbit and Cat Erythroid Cells

Mammalian erythrocytes are known to differ in 'sodium pump' activity. For example, cat erythrocytes, in contrast to rabbit erythrocytes, are unable to extrude Na^+ and accumulate K^+ against concentration gradients. Also cat erythrocytes are relatively low in Na^+-K^+ stimulated adenosinetriphosphatase (NaKA)[1]. Genetically significant differences in 'sodium pump' activity have been found within individuals of a given species. Tosteson obtained a direct correlation of active transport of cations in sheep erythrocytes, known to be high (HK) and low (LK) in potassium, with NaKA fractions[2]. Baker and Simmons have shown that individuals of the Australian marsupial species, the possum (*Trichosurus vulpecula*) differ in sodium and potassium concentrations[3]. The LK possum has a low erythroid K^+ characterized by absence of NaKA in the cell membrane.

Since preliminary experiments indicate that ouabain retards accumulation of iron in the rabbit reticulocyte speculation is raised as to whether NaKA somehow is involved in iron transport[4]. Recently Sheeler and Barber followed iron incorporation in rabbit and turtle reticulocytes[5]. Cells were produced by injection of phenylhydrazine. They found that more iron was retained in the stroma fraction of the red cell hemolysate of the turtle than the rabbit. In this respect turtle and avian reticulocytes are alike[6]. However, it is known that the red cell stroma of birds, reptiles and amphibians, in contrast to mammals, is comprised of cell nuclei as well as membrane[7].

In the present study rabbit and cat erythrocytes and reticulocytes have been analyzed for ATPase, total and NaKA, and these activities correlated with cellular iron uptake. The experimental animals were New Zealand rabbits and mixed breeds of cats. Reticulocytosis was induced by injecting 0.25 ml/kg of 2.5% aqueous phenylhydrazine daily 4 consecutive days. Blood was drawn by cardiac puncture on the 7th day. Cats were less refractory to the compound as several did not survive the treatment. The reticulocytes, identified with New Methylene Blue, increased to 55–65% of the blood cells. For simplicity, the blood cells are referred to as cells, or reticulocytes.

Cell Iron Fractionation: Cells were washed 3 times with isotonic (0.28 *M*) tris [2-amino-2-(hydroxymethyl)-1,3 propanediol], brought to pH 7.2–7.4 with HCl. 5.0 ml of packed cells were then suspended in 95.0 ml of the *tris*-Cl solution. A 1.0 ml aliquot of this cell suspension was introduced into each of a number of test-tubes which were centrifuged 1 min at 750 *g*. The cells in each tube were resuspended in 5.0 ml of solution containing 125 m*M* NaCl, 5 m*M* KCl, 1 m*M* $MgCl_2$, 19 m*M* *tris*-Cl buffer and 10^{-8} to 10^{-7} *M* iron (Fe^{59} labeled[8]). Each preparation was then agitated in a water bath 4 h at 37 °C, after which it was centrifuged 1 min. Again the cells were resuspended, this time in 2.0 ml of isotonic NaCl solution containing non-radioactive $FeCl_3$ in identical molar concentration. After a repeated centrifugation the cells were hemolyzed with 2.0 ml water. This preparation was finally centrifuged 3 min. Radioactivity was assayed with a Nuclear-Chicago DS5 well-scintillation detector, attached to a 181A decade scaler. Fe^{59} was counted in the hemolysate (total) and supernatant fraction separately. Stroma Fe^{59} was considered as the difference in counts.

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