Larvae obtained from the faecal cultures from infected hamsters were infective for all age groups of hamsters in the subsequent generations with single dose infection. The adult male of the species measured 6–7.5 mm in length and 0.27–0.30 mm in width. The adult female of the species measured 6–9.2 mm in length and 0.30–0.43 mm in width. To show further that hamster and *A. ceylanicum* could develop to a satisfactory host-parasite system, results of hamster strain of *A. ceylanicum* in generation I and II (with single dose infection) are also summarized and incorporated in the Table. Incidentally, it may be mentioned here that a hamster strain *A. ceylanicum* is being maintained in this laboratory.

This communication gives only the results of a series of experiments and presents evidence that hamster is a suitable host for *A. ceylanicum*. A series of experiments are now being carried out to induce infection in golden hamsters with a pure strain of *A. ceylanicum* infection from dogs. The results would be published in due course[18].

Zusammenfassung. Es gelang, den Hakenwurm *Ancylostoma ceylanicum* an den Goldhamster zu adaptieren, was zur Vereinfachung chemotherapeutischer Versuche bei der Bekämpfung dieses tierischen und menschlichen Parasiten im Laboratorium beitrug.

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Effects of Some Tropical Diseases on the Urea Index

The urea index, defined as g urea/g creatinine determined in random urine samples, was introduced several years ago as a method of screening the protein intake of a human population[1]. It has been widely used in many nutrition surveys[2–7]. The theoretical basis of the index is that dietary proteins in excess of the daily requirement are deaminated by the liver and the resulting ammonia is converted to urea, which is excreted in the urine. Creatinine is the exclusive urinary metabolite of muscle creatine and is excreted in amounts proportional to the daily muscular activity. Dietary protein has no effect on urinary creatinine. Particularly in rural communities, daily creatinine excretion is relatively constant in an individual. While the absolute concentrations of urea and creatinine in a random urine sample vary with the recent water intake, the ratio of their concentrations is reasonably constant throughout the day and is a reflection of recent protein intake[1].

The index fails in starvation, when body protein is mobilized to provide energy and excessive urea is excreted. With this one exception, the index is believed to be a useful tool for surveys of the nutritional status of human populations.

Previous investigators have taken little or no account of endemic infectious diseases in the people they have studied. We felt that several widespread tropical diseases, known to influence intestinal absorption, liver metabolism, and kidney function, might well alter the formation or excretion of urea, creatinine or both. We have therefore studied individuals living in rural villages of northern Zambia where bilharziasis, malaria, and hookworm disease are endemic and largely untreated.

Individuals were given a general medical examination and samples of blood, urine and faeces were collected and

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Table I. Urea index for children under 13 years of age

Diagnosis	Sex	No.	Urea index (g urea/g creatinine) mean ± S.D.	*P* value
Healthy	♂	38	17.8 ± 6.6	–
Healthy	♀	36	18.6 ± 7.7	–
Bilharziasis	♂	24	13.1 ± 7.3	<0.02
Bilharziasis	♀	8	12.4 ± 6.5	<0.01
Malaria	♂	37	17.3 ± 8.9	N.S.
Malaria	♀	35	19.0 ± 6.5	N.S.
Hookworm disease	♂	23	20.9 ± 10.6	N.S.
Hookworm disease	♀	25	19.6 ± 9.7	N.S.

Table II. Urea index for adults

Diagnosis	Sex	No.	Urea index (g urea/g creatinine) mean ± S.D.	*P* value
Healthy	♂	18	17.1 ± 5.1	–
Healthy	♀	12	17.3 ± 10.7	–
Bilharziasis	♂	17	11.8 ± 5.0	<0.01
Bilharziasis	♀	18	11.9 ± 6.2	<0.01
Malaria	♂	19	19.9 ± 5.2	N.S.
Malaria	♀	19	14.5 ± 12.9	N.S.
Hookworm disease	♂	21	16.1 ± 8.7	N.S.
Hookworm disease	♀	34	14.5 ± 12.2	N.S.

examined for parasites, using standard methods[8]. Urine was preserved in insulated icechests and transported to Lusaka for laboratory analysis. Urea and creatinine were determined using standard autoanalyzer methods[9,10].

The urea index (g urea/g creatinine) was calculated for each individual and the mean values and standard deviations were computed for particular groups depending upon age, sex, and the presence or absence of particular diseases. Individuals with more than one disease were excluded from the study.

Mean body weights and heights of the various groups were also calculated and compared. There were no significant differences in either for any of the disease groups, as compared to healthy controls of the same age and sex.

Tables I and II list the urea indices for children (under 13 years of age) and adults. The sexes are given separately in each case. A *t*-test was then conducted to determine the statistical significance, if any, of differences between the mean values for the healthy control groups and groups of the same sex infected by 1 of the 3 previously mentioned diseases. *P*-values were calculated and are given in the Tables when significant.

It is immediately obvious from the results that infection by malaria or hookworms does not influence the urea index, but bilharziasis has a significant lowering effect in both sexes for children and adults.

Two forms of bilharziasis are common in Africa[11]. In northern Zambia the most usual form is the genito-urinary infection due to *Schistosoma hematobium*, and this is the parasite responsible for the disease in the patients of this study. The intestinal bilharziasis, caused by *S. mansoni*, is rare in the area and was not found in any of the patients.

Untreated urinary bilharziasis produces lesions throughout the urinary tract and kidneys, but rarely affects other organs, with the exception of the spleen[11]. Its effect on urea and creatinine excretion is most likely due to an alteration in renal thresholds that will later lead to more serious renal failure and uremia.

The lack of difference in body weight or height between healthy subjects and those with bilharziasis is a strong indication that their diets are the same. The two groups were living intermingled in the same villages. Hence, it is our conclusion that the urea index cannot be used as a criterion of protein nutrition in areas of the world where urinary bilharziasis is endemic.

Résumé. Chez les sujets atteints de bilharziose urinaire, le rapport urée/créatinine était considérablement moindre que chez les témoins. Par contre ni le palludisme ni l'ankylostomiase n'ont produit un tel effet.

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Beitrag zur Ätiologie der Hexenbesenkrankheit der Kaktee *Opuntia tuna* (= *tuna monstrosa*)

Während eines kurzen Besuches der Reichsanstalt in Berlin-Dahlem im Oktober 1962 erfuhr einer von uns (K.M.) von Dr. H. A. USCHDRAWEIT, dass die *Opuntia tuna monstrosa* keine Ziervariante, sondern eine kranke *Opuntia tuna* ist. Die Monstrosität dieser Pflanze konnte nämlich durch Pfropfung auf normale *O. tuna* übertragen werden. Anfang 1963 bestellten wir einige *O. tuna monstrosa* von einer deutschen Kakteenfirma und züchteten sie während der folgenden Jahre im Gewächshaus unseres Institutes. In mehreren Versuchen gelang es uns nicht, andere Arten derselben Familie durch Pfropfung zu infizieren, obwohl in einigen Fällen die gepfropften Teile in der neuen Wirtspflanze bis zu 2 Jahre am Leben blieben.

Elektronenmikroskopische Untersuchungen ultrafeiner Schnitte der *O. tuna monstrosa* zeigten in den Phloemelementen oft Formen, die an Mycoplasma erinnerten (Figur 1). Das bestätigte den Befund von LESEMAN und CASPAR[1]. Eine ähnliche Krankheit der *Opuntia exaltata* wurde mit warmem Wasser erfolgreich behandelt[2]. Diese Beobachtungen gaben Anlass zu der Vermutung, dass die Hexenbesenkrankheit durch Mycoplasma verursacht wird.

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