together with some idea of the effective increase in internal surface area. A single gut cell in *D. subclavatus*, for example, supports approximately 1000 of these processes, and a square millimetre of gut surface something of the order of 26,000,000. These numbers bring about an increase in internal surface area of the gut of about 115–120 times. Although no electron microscope observations were made on any of the other species, estimates with the light microscope indicate a similar increase in internal surface area.

The most obvious conclusion as to the function of these microvilli-like processes in the gut of digenetic trematodes is that, by virtue of the enormous internal surface area they provide, they greatly enhance absorption of food from the gut lumen. This is supported by the presence in the processes of acid phosphatase, an enzyme which is commonly associated with sites of active carbohydrate transfer. In addition, a non-specific esterase has been detected in the gut and in association with the processes of at least 3 of the trematodes, *D. subclavatus*, *G. vitelliloba* and *G. cygnoides*, so that it is possible the structures may also have a role in digestion. In this connection, supporting evidence comes from the work of UGOLEV[4] who has demonstrated the importance of the intestinal surface on the rate of hydrolysis of starch in vertebrates, and who believes there to be hydrolytic enzymes adsorbed on the surface of the microvilli which provide an intermediate link between cavital hydrolysis and absorption.

Microvilli-like structures have never been observed in the gut of the Monogenea, *Polystoma integerrimum*, *Diplozoon paradoxum*, *Discocotyle sagittata*, *Diclidophora merlangi* and *Octodactylus palmata*, during the present study, nor are there any reports of such in the literature. Indeed any variations in gastrodermal structure that exist in this group can be related to differences in diet[5]. The gut in the Monogenea is generally a much branched and diffuse structure, however, whilst that of the Digenea is characterized by its apparent simplicity, the only exception being in certain members of the Fasciolidae where the gut caeca resemble those of a typical monogenean trematode. This difference in the gross structure of the gut within the Trematoda may well be related to the differences in gastrodermal structure, the microvilli of the Digenea greatly increasing the internal surface area and thereby compensating for the lack of branched and subdivided diverticula so characteristic of the Monogenea.

Résumé. Etude microscopique de la structure du tube digestif de 7 espèces de Digenea (Trematoda). Dans toutes les espèces, les cellules du gastroderme possèdent des microvillosités nombreuses qui donnent une réaction positive avec PAS et la phosphatase acide. Ces structures augmentent considérablement la surface cellulaire de l'intestin simple. Leur rôle dans la digestion et l'absorption est discutée.

D. W. HALTON[6]

Department of Zoology, The University, Leeds (England), July 18, 1966.

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[6] Present address: Department of Zoology, The Queen's University, Belfast, Northern Ireland.

A Comparison of Lymph Collected from the Thoracic Duct in CBA and A Strain Mice[1]

Increasing attention has been given in recent years to the use of isolated lymphocytes for immunological studies, and different methods for collecting lymph from the thoracic duct of mice have been described (SHREWBURY[2], GESNER and GOWANS[3], and BOAK and WOODRUFF[4]). This paper compares the results of collecting lymph from the thoracic duct of 2 strains of mice over several days under sterile conditions.

Material and methods. Male white mice of the 'A strain', weighing 25–30 g and male and female CBA mice, weighing 23–28 g were used.

About 2 h before operation 0.2 ml of olive oil was given orally. The animals were anaesthetized with injections of nembutal given s.c. and supplemented with ether. The operation technique described by BOAK and WOODRUFF[4] was used but we did not give s.c. injections of saline with heparin after operation. The cannulae (mouse cannula, Portex Plastic Ltd.) were sterilized with 70% ethanol for 30–60 min.

The lymph was collected in sterile tubes containing Hank's solution with 14 U of heparin/ml or 20% normal mouse serum in Tyrode solution with 200 U of heparin/ml. For special purpose the tubes were placed in an ice bath.

The cells were counted in chambers and the differential cell counts were made on smears stained with Leishman's stain. For sterility tests blood agar plates, Sabouraud's agar plates and broth were used.

The mice were fixed in a comfortable position on rotating drums (GESNER and GOWANS[3]), and the food hopper and drinking bottle were adjusted so as to be within easy reach. The animals were kept clean and warm. Clots which formed in the cannulae were removed with a fine stainless-steel wire and the cannulae were washed carefully with a small volume (0.05 ml) of Hank's solution.

Results. A strain mice: The mean volumes of lymph and the mean total of lymphocytes collected during successive 24 h intervals are summarized in the Table. The samples of lymph were sterile. About 90–95% of the cells in the lymph produced during 24–48 h were morphologically typical small lymphocytes; the remaining cells were medium size and large lymphocytes. During the third and fourth days, usually a higher percentage of medium or larger cells was found. Most of the mice appeared well and lively during the experiment.

CBA mice: The results in CBA mice are summarized in the Table. The samples of lymph were found sterile.

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The mean total number of lymphocytes as well as the mean volume of lymph were found to be somewhat less than the values found with A strain mice. An increased number of medium size and larger cells was found on the second and succeeding days of collection.

The CBA mice did not appear well during the period of observation. They were generally less active, did not work on the rotating drums and did not eat or drink. These mice seemed to be less suitable for cannulation as the walls of the ducts were found to be much softer and more fragile than in A strain mice and the post-operative treatment of CBA mice was also more difficult.

Mean total of lymphocytes and mean volume of lymph collected from A strain and CBA mice during successive 24 h intervals after cannulation

Days after operation	A strain mice			CBA mice		
	No. of animals	Mean total lymphocytes (10^6)	Mean volume of lymph (ml)	No. of animals	Mean total lymphocytes (10^6)	Mean volume of lymph (ml)
1	8	74.1	8.0	8	50.7	4.3
2	8	70.3	8.5	6	42.9	5.3
3	8	60.5	8.8	2	7.9	3.6
4	3	22.4	7.0	2	1.9	2.6

Discussion. The results indicated that the modified technique is suitable for collecting lymph for several days from the lymphatic duct of mice under sterile conditions. The mean volume of lymph and the mean total cell count were somewhat less than the values reported by GESNER and GOWANS[3] for white mice and BOAK and WOODRUFF[4] for CBA mice. The difference in volume and/or number of lymphocytes yielded between both strains of mice corresponded to the post-operative recovery pattern and especially to the amount of saline which the animals had drunk[5].

Zusammenfassung. Modifizierte Technik zur Entnahme der Lymphe aus dem Ductus thoracicus von Mäusen unter sterilen Bedingungen im Verlaufe einiger Tage: Die Mittelwerte der Lymphmenge und der Zellen, welche in 24-stündigen Intervallen (vom 1.–4. Tage nach der Operation) gewonnen wurden, sowie die Differenz zwischen dem A- und CBA-Stamm der Mäuse werden festgestellt.

V. HOUBA[6] and J. HOUBA

National Institute for Medical Research, Mill Hill, London N.W.7. (England), July 5, 1966.

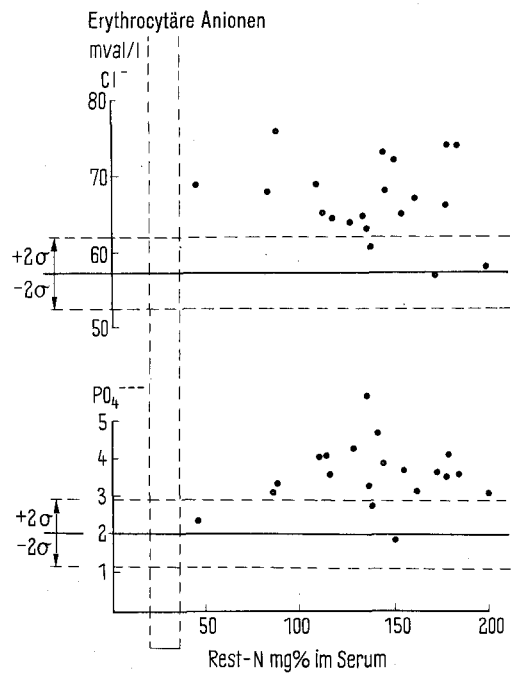
[5] The operative procedure was kindly demonstrated to us by Dr. BOAK (Department of Surgical Science, University of Edinburgh). – We are indebted to Dr. D. R. BANGHAM for helpful discussion.

[6] Present address: Research Institute for Rheumatic Diseases, Na Slupi 4, Prague 2, Czechoslovakia.

Erythrocytäre Anionenkonzentrationen bei renaler Insuffizienz

Bei renal bedingten metabolischen Acidosen wurde der erythrocytäre Kalium- und Natriumgehalt erniedrigt[1,2], der erythrocytäre Magnesiumgehalt jedoch erhöht[3] gefunden. Im folgenden wird über Untersuchungen der erythrocytären Anionenkonzentrationen Chlorid (Cl^-) und anorganisches Phosphat (PO_4^{---}) bei Patienten, die an chronischen renalen Insuffizienzen litten, berichtet.

Methoden. Cl^-: mercurimetrisch nach LANG[4]. PO_4^{---}: kolorimetrisch nach FISKE und SUBBAROW[5]. Das Vorgehen bei der Gewinnung des Erythrocytenkonzentrats und die übrigen analytischen Verfahren entsprachen den früher verwendeten Methoden[3,6]. Bei den angegebenen erythrocytären Anionenwerten handelt es sich jeweils um die arithmetischen Mittel aus Vierfachbestimmungen. Die auf Grund von 20 Vierfachbestimmungen mit der χ^2-Funktion ermittelten Genauigkeitsgrade (s) betrugen für die



Verhalten der erythrocytären Anionenkonzentrationen Cl^- und PO_4^{--} bei Steigerungen der Rest-N-Konzentration des Serums.

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