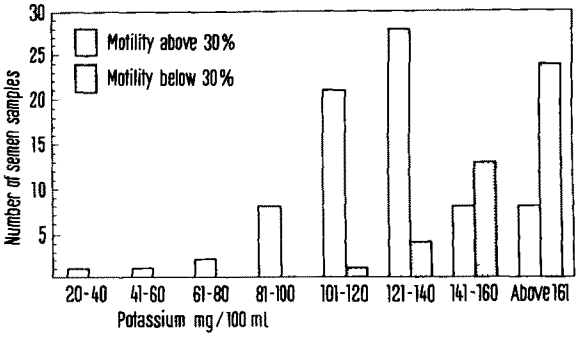
ratively lower than in poor motility samples which had 196 mg/100 ml (S.E. ± 11.8). The difference in the potassium values of the two groups was found to be statistically significant. The Figure shows the distribution of semen samples in the two groups according to their potassium level.

The observation that there is a considerable difference in potassium level of seminal plasma separated from semen containing spermatozoa of good and poor motility is of significance. It has been clearly demonstrated by many workers (MARDEN and WERTHESEN[8], ROZIN[9], MACLEOD and FREUND[10], and SHETH and RAO[11]) that seminal plasma exerts a marked influence on the motility and metabolism of animal and human semen. Experimental data presented here indicate that potassium is one of the important constituents of seminal plasma which could influence the motility of spermatozoa. The observations of CRAGLE and SALISBURY[4] are of great significance in the context of the results reported here. They observed that epididymal secretions of the bull exhibited a high value for potassium. It is known that epididymal spermatozoa were in a 'quiscent' stage as compared to ejaculated spermatozoa. They postulated that, on ejaculation, the high potassium level of epididymal secretion gets diluted with sodium and calcium from other secretions of the accessory glands. This they suppose to overcome the inhibitory effect of potassium on the motility of spermatozoa.

WALES and WHITE[2] found that neither magnesium nor calcium eliminated the toxic effect of potassium. Attempts are being made in our laboratory to study in detail the effect of potassium and other metals on sperm motility. The results will be reported elsewhere[12].



The distribution of semen samples, according to their potassium content

Résumé. Il est connu que la motilité et le métabolisme des spermes de mammifères sont sous influence des ions inorganiques, spécialement des ions de potassium. Nous avons étudié le contenu de potassium dans des échantillons de personnes fertiles et infertiles. Nous avons observé que les échantillons dont 30% de spermes étaient motiles, ont la teneur de potassium peu élevée. Les résultats indiquent que le potassium est un des constituants importants du plasma séminal et qu'il a une forte influence sur la motilité des spermes.

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[12] *Acknowledgment.* We are deeply grateful to Dr. V. R. KHANOLKAR, Director, for his invaluable help and encouragement in the course of this work.

The Influence of Sodium Transport on Glucose Transport by an *in vitro* Intestinal Preparation

It is well established[1,2] that glucose transport through the intestinal wall is an active process, because glucose can be accumulated in the cells as well as in the serosal medium against the concentration gradient. Furthermore, sodium active transport appears to be necessary for active sodium transport[3].

In order to investigate the interrelations existing between sodium and glucose transport, we have performed a series of experiments on an intestinal *in vitro* preparation. The isolated small intestine of albino male rats was perfused with isosmotic Krebs-Henseleit bicarbonate buffer solutions containing different sodium concentrations and the net sodium transfer from the mucosal to the serosal side, as well as the total glucose disappeared and the glucose transported to the serosal side, were determined.

The method of perfusing the intestine is similar to that described by SMYTH and TAYLOR[4]. In order to maintain the same osmotic pressure of the perfusing fluid and to diminish the sodium content, NaCl was partially substituted by isosmolar amounts of urea, mannitol or KCl.

The results so far obtained are collected in the Table. Sodium net transfer decreases in the same way as sodium concentration in the outer solution (mucosal medium), as was observed by other authors[5,6]. The ratio between transported sodium and glucose through the same intestine in any condition does not substantially deviate from the control values. In the experiments in which urea or mannitol were used, the reduction in glucose transport seems not to be due to a minor glucose concentration in the epithelial cells because the glucose utilisation remains at the same level as in the controls. On the other hand, in the experiments in which NaCl was substituted by KCl, the glucose utilisation as well as the glucose transport decrease in the same time as sodium concentration. CRANE et al.[1] have reported similar results with regard to sugars accumulation when sodium was substituted by potassium. Therefore the results of CRANE et al. on sugars accumulation and our data on glucose utilisation seem to

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Small intestine of albino male rats (Wistar strain) weighing about 250 g. Length of perfused intestine 30 cm starting from pylorus, fresh weight 1.52±0.08 g. Initial quantity of circulating solution 50 ml. Time of perfusion 1 h. Temperature of perfusing solution 38°C. Oxigenation with a mixture of O_2 95% and CO_2 5%. The number of experiments (n) for each group and the mean values ± S.E. are reported.

Perfusing solution	Transported solution ml/h	Transported Na μE/h	Transported glucose μM/h	Transp.Na(E) Transp.Gluc.(*M*)	Glucose concentration in transp. sol. m*M*/l	Total disappeared glucose[a] μ*M*/h
Krebs + glucose 13.9 m*M*/l n = 8	3.33 ± 0.34	520 ± 50	75.5 ± 12.2	9.5 ± 12.2	27.4 ± 5.1	275 ± 17
Krebs + glucose as above NaCl content reduced to 84 m*M*/l and addition of an isosmolar quantity of urea n = 8	2.08 ± 0.22	290 ± 30	21.1 ± 2.6	14.2 ± 1.2	10.3 ± 0.8	309 ± 6.6
Krebs + glucose as above NaCl content reduced to 54 m*M*/l and addition of an isosmolar quantity of urea n = 7	2.19 ± 0.25	149 ± 19.6	34.8 ± 6.3	6.3 ± 1.5	13.7 ± 3.1	292 ± 33
Krebs + glucose as above NaCl reduced to 54 m*M*/l and addition of an isosmolar quantity of mannitol n = 4	1.56 ± 0.60	108 ± 10	12.2 ± 4.9	13.1 ± 2.5	6.6 ± 1.25	356 ± 45
Krebs + glucose as above Na reduced to 84 mE/l and addition of an isomolar quantity of K n = 8	1.46 ± 0.27	200 ± 28	12.4 ± 2.4	21.1 ± 6.3	8.71 ± 0.4	196 ± 21.5
Krebs + glucose as above Na reduced to 54 mE/l and addition of an isomolar quantity of K n = 8	0.67 ± 0.10	23.5 ± 7.4	3.4 ± 0.4	7.3 ± 0.9	5.3 ± 0.5	133 ± 12.6

[a] Glucose of the initial pool not recovered in perfusing and collected fluids at the end of experiments.

be due to the influence of the increase in potassium concentration rather than to a decrease in sodium.

In conclusion it can be supposed that sodium transport is necessary chiefly for the extrusion of glucose from the cells in the serosal medium. The necessity of sodium transfer for this last step of glucose transport seems not to originate from the restriction of the volume of transported water. In effect water transport does not decrease to the same extent as sodium, especially in the experiments in which urea is employed as substituent, and the glucose concentration in the transported fluids falls below the level present in the controls. There is thus same evidence for admitting that the extrusion of glucose from the cells is determined by a mechanism more complicated than a simple physical diffusion.

Riassunto. Vengono riportati i dati ottenuti sul trasporto di sodio e di glucosio attraverso l'intestino isolato di ratto, perfuso con soluzioni isotoniche a diverso contenuto di sodio. Da questi dati appare che non solo il trasporto di sodio dipende dalla concentrazione di sodio nel liquido mucosale, ma anche il trasporto di glucosio. Si prospetta l'ipotesi, inoltre, che il passaggio di sodio dalla mucosa alla sierosa sia necessario sopratutto per il trasferimento del glucosio dalle cellule al liquido serosale.

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Derivate des 6,11-Dihydrodibenz(b,e)thiepins, eine neue Gruppe von psychotropen Substanzen[1]

Als Fortsetzung unserer vorherigen Arbeiten in den Gruppen der Neuro- und Psychopharmaka, deren Struktur durch das Vorhandensein eines tricyclischen Systems mit einem siebengliedrigen Mittelring charakterisiert ist[2], gingen wir vor fast zwei Jahren zur systematischen Bearbeitung der 6,11-Dihydrodibenz(b,e)thiepinderivate über. Dieses heterocyclische System war bis in neueste Zeit unbekannt. Erst am Anfang dieses Jahres publizierten STACH und SPINGLER[3] eine kurze Mitteilung, in der sie die Darstellung des 6,11-Dihydrodibenz(b,e)thiepin-11-ons (I, $R^1 = R^2 = H$) und seiner 2-Methyl- und 2-Chlorderivate durch Ringschluss der entsprechenden *o*-(Phenylmercaptomethyl)benzoesäuren (III) mit Polyphosphorsäure erwähnen und zugleich die Möglichkeit der weiteren synthetischen Auswertung dieser Ketone andeuten. Diese Arbeit veranlasste uns zur vorläufigen Mitteilung unserer bisherigen Ergebnisse in der vorliegenden Form, obwohl unsere Experimente noch nicht ganz abgeschlossen sind.

Unsere experimentellen Bemühungen konzentrierten sich in erster Reihe auch auf das Keton I ($R^1 = R^2 = H$), das wir zuerst in niedriger Ausbeute, von der S-Benzylthiosalicylsäure (II)[4] ausgehend, erhielten, und zwar

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