Discussion. According to the present experiments chlorpromazine and structurally related compounds cause a shift of endogenous 5HT from platelets into the plasma. This can be concluded from the observation that in animals pretreated with a monoamine oxidase inhibitor almost all the 5HT disappearing from platelets was found in the plasma. The incomplete recovery of 5HT disappearing from platelets of animals not pretreated with a monoamine oxidase inhibitor is probably due to partial oxydation of 5HT.

The chlorpromazine-induced decrease of platelet 5HT might be due to liberation of 5HT or, provided that the 5HT of platelets is in a dynamic equilibrium with the 5HT in plasma, to inhibition of 5HT uptake. From experiments with imipramine and cocaine, however, the latter possibility seems unlikely. Thus, imipramine (5×10^{-7} *M*/l) inhibits 5HT uptake in concentrations about 100 times lower than chlorpromazine (3.5×10^{-5} *M*/l)[4]; the two drugs are, however, about equally effective in decreasing endogenous 5HT in platelets. Furthermore, cocaine (2.5×10^{-5} *M*/l) decreases 5HT uptake in about the same concentration as chlorpromazine[4]; cocaine is, however, less effective in lowering platelet 5HT.

The mechanism by which chlorpromazine causes 5HT decrease in platelets is probably different from that of reserpine. Thus, within 4 h reserpine reduced the 5HT of platelets by a maximum of 50% only[10], whereas chlorpromazine decreased the amine by 76%. Furthermore, chlorpromazine was able to cause an additional decrease of the 5HT after reserpine had exerted its maximal effect. It may be assumed that reserpine impairs active transport or storage of 5HT and that therefore the amine content of platelets decreases with the velocity of passive diffusion of 5HT into the plasma[11]. In consequence, an enhancement of the reserpine-induced 5HT decrease by chlorpromazine might indicate accelerated diffusion of 5HT possibly due to increased permeability of the membrane of platelets.

It remains to be elucidated whether chlorpromazine and related compounds have a similar action *in vivo* and whether this effect is related to the chlorpromazine-induced changes of monoamine metabolism observed in the brain *in vivo*[12,13].

Riassunto. Cloropromazina, imipramina, cloroprotixene e amitriptilina *in vitro* diminiscono la 5-idrossitriptamina (5HT) endogena nei trombociti di coniglio e, per quanto si è visto, anche in quelli umani. Nel plasma di coniglio pretrattato con isocarbossazide, inibitore della mono-amino-ossidasi, si osserva un corrispondente aumento di 5HT. Cocaina, α-metil-dopa e triptamina hanno un effetto meno pronunciato sulla 5HT delle piastrine.

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Photosynthesis in *Cuscuta*

The genus *Cuscuta* is characterised by its comparative lack of chlorophyll and its complete dependence, after the seedling stage, on a host plant. Some species such as *C. gronovii* are greenish, but do not survive independently though Loo[1] succeeded in growing excised tips of *C. campestris* for a period of five months in an organic culture medium. The presence of chlorophyll in *Cuscuta* has been noted by many workers notably THOMSON[2], MACKINNEY[3], and WALZEL[4]. However, in the literature, no reference to conclusive evidence that dodders fix carbon dioxide has been found.

In the present work two species were tested for CO_2 fixation, *C. gronovii* which is green mottled with red, and *C. campestris* Yuncker which is orange-yellow. Into each of six 250 ml flasks was placed 1 g of freshly harvested *C. gronovii* filament, 1 g of *C. campestris* filament, and one leaf of *Pelargonium* sp. respectively. (The Pelargonium leaves used varied between 0.3 and 0.35 g fresh weight.) In the bottom of each flask was placed a small dish containing 4 μ C ^{14}C sodium bicarbonate solution together with sufficient $NaHCO_3$ carrier to give a final atmosphere of 2% CO_2 within the flask. The volume of solution in the dish was 0.3 ml. To release the CO_2, 0.1 ml saturated citric acid solution was added by pipette to the dishes, and the flasks stoppered immediately. The flasks were left in bright sunlight for periods ranging from 15 min to 4 h. Two controls were set up; one flask similar to the above was left in the dark for 4 h, while another flask containing plant material previously boiled for 5 min was exposed to sunlight for 4 h.

At the end of the experimental periods, the *Cuscuta* and leaf samples were separately placed in 25 ml of 90% ethanol, macerated in a mortar, and the extracts filtered. A few drops of $NaHCO_3$ solution, followed by a similar amount of saturated citric acid solution were added to the filtrate to remove any traces of radioactive bicarbonate contamination. Each extract was evaporated to dryness at 100°C and then taken up in 1 ml distilled water. 0.5 ml of this extract was evaporated to dryness on a planchette and analysed for radioactivity on a Geiger-Müller end-window counter. The results are shown in the Table.

Exposure time to $^{14}CO_2$	*C. gronovii*	*C. campestris*	*Pelargonium* leaf
15 min	124	160	340
30 min	200	263	508
1 h	280	379	528
2 h	567	468	1009
3 h	811	604	2044
4 h	1065	938	4218
Control in dark	121	113	207
Control (boiled material)	68	71	71

Results given as counts per 5 min. Background: 63 counts/5 min. Efficiency of counter: 1% approximately.

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Previously in this laboratory, experiments similar to that described above, but using double the isotope concentration were performed to determine into which metabolites the ^{14}C had been incorporated. In these experiments the filtrate, after the addition of $NaHCO_3$ and citric acid to remove bicarbonate contamination was evaporated at 50°C under reduced pressure to a final volume of approximately 0.5 ml. 10 µl aliquots of this solution were applied to 24 cm circular Whatman No. 1 filter paper and chromatographed horizontally using *n*-butanol, pyridine, water (3:2:1.5) as developer. Chromatograms were also made simultaneously of a mixture of known amounts of glucose, fructose, maltose, and sucrose. After development and drying the filter paper was placed on a sheet of 'Industrex type D' X-ray film and kept in the dark at 4°C for 14 days. The filter paper was then sprayed with naphthoresorcinol to reveal the sugar zones. On development of the X-ray film it was found that virtually all the radioactivity was present in one zone, which corresponded exactly with the sucrose zone on the filter paper.

From these results it is concluded that CO_2-fixation in the two dodders tested is a photosynthetic process, and that on a fresh weight basis, the level of photosynthesis in *C. gronovii* and *C. campestris* is similar, and equal to about one tenth the level in *Pelargonium* leaves.

Zusammenfassung. Die in *Cuscuta gronovii* und *C. Campestris* bewiesene Photosynthese ist in ihrem Ausmass in beiden Arten gleichwertig und beträgt ungefähr ein Zehntel desjenigen von Pelargonium-Blättern. Als photosynthetisches Produkt wird in beiden Pflanzen grösstenteils Saccharose festgestellt.

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Net Transport of Water and Solutes by an *in vitro* Rat Intestinal Preparation

It is well known that through the intestinal wall, as well as through other absorbing epithelial surfaces, water can be transported from lumen to serosa, either without an osmotic gradient[1,2], as against an activity gradient[2,3]. This movement of water depends on the presence of glucose, that is to say on the availability of chemical energy[1,3,4].

The net transport of water is considered by some authors[1] a process which passively follows the active transport of solutes; while, on the contrary, some others suggest an active transfer presumably by an electrosmotic mechanism[2,3]. The solution which crosses the intestinal wall is an isotonic Na solution[1,4] or a more diluted Na solution, in comparison with that present in the intestinal lumen[2].

The results here reported (Table) were obtained by using the method described by Smyth and Taylor[4]; the perfusing solution circulates only in the intestinal lumen. Determination of the freezing point and of Na and glucose contents were carried out on the collected fluids and on circulating solutions.

From our findings it appears that, either by using isotonic circulating solution, or an hypertonic one to which Na_2SO_4 has been added, the collected fluid presents in every case a freezing point lower than that of the circulating fluid at the end of the experiment. The freezing points computed from Na and glucose contents are always higher than those experimentally determined.

Under our experimental conditions, the concentration gradient produced by the transport of solutes can explain the net movement of water without the necessity of invocating an electrosmotic mechanism or a Stavermann[5] effect.

Such a gradient could be present also *in vivo* owing to a low effective blood flow in the intestinal villi because of the counter-current flow in the capillary loops[6].

Sodium sulphate produces a reduction of the total transported solutes, presumably because of dehydrating and impermeabilizing effect of the salt on the intestinal tissues.

Riassunto. Vengono riportati i dati ottenuti sul passaggio netto di acqua e di soluti attraverso l'intestino isolato di ratto, perfuso con soluzione isotonica o ipertonica per aggiunta di solfato di sodio. È stato determinato anche il Δ crioscopico dei liquidi raccolti e delle soluzioni di perfusione. Da questi dati appare che il passaggio di acqua dipende dall'istituirsi di un gradiente di concentrazione per il trasporto attivo di soluti nello stesso senso.

Il solfato di sodio eserciterebbe sui tessuti intestinali una azione impermeabilizzante, riducendo così il trasporto netto totale di soluti.

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Small intestine of albino male rat (Wistar strain) weighing 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. The number of experiments for each group are 6–8. The mean values ± S.E. are reported.

Perfusing solution	Transported solution ml/h	Transported Na µE/h	Na concentration in transp. solution mE/l	Transported glucose µ*M*/h	Glucose concent. in transp. solution m*M*/l	Total disappeared glucose µ*M*/h[a]	Freezing points ($^1/_{100}$°C) of transported solution and freezing points difference between transported solution and final perfusing solution
Krebs + glucose 13.9 m*M*/l	3.33 ± 0.34	520 ± 50	147 ± 4.6	75.5 ± 12.2	27.4 ± 5.1	275 ± 17	− 63.3 ± 0.6 − 1.6 ± 0.4
Krebs + glucose 13.9 m*M*/l + Na_2SO_4 50 m*M*/l	1.40 ± 0.27	258 ± 69	221 ± 7.5	25.3 ± 6.4	18.2 ± 4.4	234 ± 33	− 91.9 ± 1.8 − 3.5 ± 1.0

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