Biochemical Studies on the Liver Fluke, *Fasciola hepatica*, L.

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The liver fluke lives in the bile ducts, an environment poor in oxygen. Flukes, however, are not strictly anaerobic as is shown in Table 1.

Table 1. Time of survival, *in vitro*, of liver fluke. Various environments.

Environment	Time of survival
N ₂	> 1 h
Air	> "
O ₂	> "
Coal-gas, CO*	> 1 h
CO ₂	< "
H ₂ S	< 10 min
Air + KCN, 0.01 M	> 1 h
Air + H ₂ O ₂ , 0.01 M	< 10 min

* *In vivo* experiments are reported by E. Lienert. (*Private Communication*).

In order to find out whether there is a qualitative difference between parasite and host in the aerobic phase of the metabolism a survey of TCA-cycle acids present and some of the oxidation steps was performed. Some of the results obtained, *e.g.*, with paper chromatography¹ are shown in Table 2.

With the aid of a fraction from the liver fluke, Keilin-Hartree-particles², it was possible to show the occurrence of heat-labile systems

which in the presence of succinic acid, DPNH and TPNH reduced cytochrome c³. DPNH and possibly TPNH were also oxidized by air in the presence of the mentioned fraction. Preliminary isolation experiments for cytochrome c^{4,5} gave results which implies that if cytochrome c is present it occurs in concentrations less than 0.3 mg/50 g liver fluke.

1. Nordmann, R., Gauchery, O., du Ruisseau, J. P., Thomas, Y. and Nordmann, J. *Bull. Soc Chim Biol.* **36** (1954) 1641.
2. Colowick, S. P. and Kaplan, N. O. *Methods in Enzymology*. Vol. 1 (1955) 725.
3. Colowick, S. P. and Kaplan, N. O. *Methods in Enzymology*. Vol. 2 (1955) 688.
4. Colowick, S. P. and Kaplan, N. O. *Methods in Enzymology*. Vol. 2 (1955) 750.
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A Test for the Disulphide Reducing Capacity of Red Blood Cells

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Human erythrocytes reduce some disulphides¹. The rate of appearance of the corresponding thiol is the resultant of its spontaneous oxidation and the activity of the enzyme systems which participate in the reduction, *i.e.* the glutathione reductase system and the TPNH generating steps of the pentose phosphate shunt. Hexokinase may be rate deter-

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Table 2. Occurrence of some TCA-cycle acids in the liver fluke.

Citric acid	Positive finding.
Aconitic acid	Negative finding, or less than 100 µg/50 g liver fluke.
Isocitric acid	Not separated from citric acid.
α-Ketoglutaric acid	Experiment not finished.
Succinic acid	Positive finding. Large amounts.
Fumaric acid	Positive finding.
Malic acid	Positive finding.
Oxalacetic acid	Experiment not finished.