bodies were seen. Serological examination showed no antibodies in the blood, but the presence of specific antigen was detected in the liver, from which the virus was passaged to a third dog.

Liver from pup 2 stored at − 30° C. for three months was made up as a 10 per cent w/v purified suspension in saline[3] and inoculated into an eight-weeks-old mongrel pup No. 3, injecting 0·05 ml. into each eye and 10 ml. intraperitoneally. The pup developed a diffuse light central opacity of both corneas on the seventh day, which disappeared in 48 hr. without any vascular reaction, coinciding with which was a morning hyperthermia of 103·6°–104° F.; the dog thereafter was normal. Serological tests showed the presence of specific antigen in the blood on the ninth day and the appearance of antibodies from the twenty-eighth day onwards.

The clinical signs of systemic illness produced were mild, but quite definite; a similar syndrome, including the corneal lesions, has been observed in natural epidemics[2] and in experimental infections[3] of canine virus hepatitis. This diagnosis of specific virus hepatitis is supported by the detection of antibodies in the survivor of the first passage (pup 1) and of antigen in the liver of pup 2, and the confirmation of the presence of virus in this liver by the second passage inoculation into pup 3, which afterwards showed clinical illness with specific antigen and antibody in the blood.

These results show that from cases of virus hepatitis in dogs an agent can be grown in embryonated hen's eggs after yolk-sac inoculation, and that material from the twelfth egg passage filtered through a 'Gradocol' membrane can cause the clinical disease in dogs with the occurrence of specific antigen in liver and blood and of specific antibodies in the blood.

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Rapid Rate of Turnover of Potassium Ions in Kidney Slices

The steady-state turnover-rate of potassium ions in guinea pig cortex slices *in vitro* was measured by the isotope procedure developed by Krebs, Eggleston and Terner[1]. There is a rapid initial loss of potassium when kidney slices are placed in physiological saline solutions, but if 0·01 *M* α-ketoglutarate is present, the slices reabsorb the lost potassium[1] and maintain the initial concentration during at least the interval from 25 to 35 min. after the start of the incubation. When this steady state had been reached, potassium-42 chloride was added to the medium and the tissue removed either two or four minutes later. Measurements were then made of the radioactivity and the potassium content of tissue and medium with a liquid counter[2] and a flame photometer[3]. Typical results are shown in the accompanying table.

Turnover of Potassium in Kidney Cortex Slices

Guinea pig tissue suspended in 2 ml. bicarbonate saline containing 0·02 *M* glucose and 0·01 *M* α-ketoglutarate. Potassium-42 chloride added after 25 min. preliminary incubation

Incubation time after addition of potassium-42 ions		2 min.
Fresh weight of tissue		240 mgm.
Potassium ions in tissue	before incubation	17·5 μmol.
	after incubation	17·3 μmol.
Potassium ions in medium		12·6 μmol.
Radioactivity of medium	before incubation	5,320 counts/min.
	after incubation	3,680 counts/min.
Potassium ions exchanged		2·8 μmol./min.
Turnover of tissue potassium ions		16 per cent/min.

The turnover-rate (v/b) was determined from the formula[1]:

$$v = \frac{ab}{t(a+b)} \ln \frac{bx_0}{x(a+b) - ax_0},$$

where v is quantity of total potassium passing from tissue to medium, and in the opposite direction, per unit time; a is quantity of total potassium in medium; b is quantity of total potassium in tissue; x_0 is quantity of potassium-42 added to the medium at time $t = 0$; x is quantity of potassium-42 in medium at time t.

The average rate of turnover from eight experiments was 15 per cent/min. This means that an amount equal to the whole potassium content of the cells leaks out, and is absorbed against a concentration gradient, about every seven minutes. This rate of nine times an hour or more than two hundred times a day is the fastest so far found, being nearly twice that in retina[1]; four times that in brain[1] and about five hundred times that in red blood cells[4–6].

A full account of this work will be submitted for publication in the *Biochemical Journal*.

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Non-adaptive Characters in Evolution

In a recent communication[1], Dr. A. J. Cain holds that we must now accept that there is no evolution of non-adaptive—or neutral—characters in Nature. He holds this on the ground that certain characters that were previously thought to be neutral have been shown to be correlated in distribution with environmental conditions, and may therefore have some selective value. He thinks that selective value should be assumed in all characters until the contrary is proved.

The subject is controversial; many biologists believe that much differentiation, especially of the minor or trivial differences of micro-evolution, is non-