'sensitized' to an empty 'Millipore' chamber, and 'Millipore' sensitized spleen cells and liver were compared with autologous liver sensitized spleen and liver. The 'Millipore' chamber itself did not appear to activate the spleen.

Table 1

Experimental side: flares larger	Control side: flares larger	Flares equal on both sides	No. of guinea pigs used
18	3	10	31

Cells 1·5 million spleen cells, and 0·5 million antigen cells.

Adding the results of these three experiments together, the sensitized spleen and the antigen on the experimental side, and on the control side, either the sensitized spleen and a different antigen, or normal spleen and the same tissue as was used as antigen on the experimental side, the experimental side gave a greater number of larger flares than the control side.

In this group of experiments an attempt has been made to demonstrate a recognition system of ectopically placed autologous liver in a 'Millipore' chamber. It has been suggested that tissue organization and growth are partly controlled by tissue-specific antigens which undergo modification when placed outside their normal site, and that this modification is capable of activating the immune mechanism. It is believed that the prior sensitization of the spleen, which appears to elicit a larger flare in the guinea pig when injected with the sensitizing agent, as compared with the control side using unsensitized spleen, is suggestive that some such mechanism of recognition may indeed take place. It is thought that this recognition is specific and not merely a non-specific activation of the spleen, and that this was shown when larger flares were obtained when liver sensitized spleen and liver were injected and compared to liver sensitized spleen and autologous kidney.

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Inability of the Kidney of the Hagfish to secrete Phenol Red

The kidney of the hagfish (*Myxine glutinosa* L.) consists of about 70 extraordinarily large Malpighian corpuscles, which through short ducts are connected with the ureters. The latter extend from the level of the heart to the cloaca. It is assumed that two ureters (Wolffian ducts) carry out functions which in higher vertebrates are performed by kidney tubules. This theory is based on an alleged histological resemblance of the hagfish ureters to renal tubules[1]. However, it has not yet been confirmed electron-microscopically that the resemblance is a real one and not only superficial.

One of the well-known properties of renal tubules is their ability of active transport of certain organic molecules. This kind of secretion has been demonstrated both in whole kidneys and isolated tubules from various vertebrates[2,3]. A similar kind of secretion is accomplished by the liver during the formation of the bile[4,5].

In order to determine whether or not the ureters of the hagfish are able to function as substitutes for tubules, living specimens of *Myxine glutinosa* were injected subcutaneously with 1 ml. sea-water containing chlorophenol red in a contraction of 10^{-4} g/ml. The animals were kept in aquaria with running sea-water, and investigated 3–48 h after the injection.

It is found that the hagfishes after 1–2 days had eliminated most of the injected dye from their tissues. Not at any time during this period did chlorophenol red appear in the urine. In most of the animals, however, the liver had a slightly red colour, and the gall bladder contained bile mixed with chlorophenol red at a concentration higher than that of the injected solution. Similar experiments with fluorescein in a concentration of 10^{-4} g/ml. also demonstrated a secretion exclusively by the liver. No fluorescein was discovered at any time after injection in the ureters by examination under ultra-violet light.

It can be concluded that in *Myxine* the ureter epithelium does not react to handle chlorophenol red or fluorescein. This is probably true also for a series of other organic compounds. Nevertheless, in some respects the ureter epithelium shows similarities with ordinary renal tubular epithelium. Thus alkaline phosphatase activity can be demonstrated[6]. This enzyme may take part in a mechanism for re-absorption of glucose. The liver of the hagfish is built like a tubular gland[7], and probably the hagfish liver tubules secrete chlorophenol red and other compounds by a transport mechanism similar to those active in the renal tubules and the liver of higher vertebrates.

Presumably the secretion of phenol red, etc., by kidneys of many animals reflects an ability to transport certain naturally occurring substances like hippuric acid[2]. If this is true, such products in the hagfish have to be eliminated by the liver and not by the kidney. The inability of the hagfish kidney to transport chlorophenol red and fluorescein seems to be a consequence of its 'atubular' condition. In hagfish urine seems to be formed without interference of secretory processes, but further data are needed to verify this theory.

We thank Prof. Björn Föyn and Finn Walvik at the Marine Biological Station, Dröbak, Oslo Fjord, for material and laboratory space. The work was supported by the Nansen Foundation.

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Polymorphism in Living and Pleistocene Populations of the African Land Snail, *Limicolaria martensiana*

Diver[1] has shown that polymorphism in colour and pattern in living populations of the land snail, *Cepaea*, may also be distinguished in Pleistocene fossils, and although there may have been changes in the relative frequency of the colour forms, the polymorphism has persisted for thousands of years.

Examination of fossil shells of the land snail, *Limicolaria martensiana* (Sm.), obtained from volcanic ash deposits in the Katwe explosion area in the Western Rift of Uganda reveals that here also polymorphism has been maintained for a long time: radio carbon dating and surface morphology suggest that the Katwe ashes are 8,000–10,000 years old[2]. Although the *Limicolaria* shells are somewhat faded (not all the possible colour forms would be distinguishable), heavily streaked and pallid forms occur in the same horizons and their relative frequency can be compared with that of modern populations living in the same areas. As shown in Table 1, at one locality, Equator Road, streaked shells comprise 67·9 per cent of the fossil population and only 42·7 per cent of the living population. This is a statistically significant difference: