are especially suitable for the diet of convalescents. Thus orange gelatine was more easily handled by the stomach than the commonly used orange albumin. The preparations containing milk and eggs serve as vehicles and make it possible to increase in the diet the amount of these foods for which some persons (especially children) may have a distaste.

In ten individuals showing hypo- or hyper-acidity, gelatine was also readily digested. It should prove of value in stomach disorders because of the slight burden it places on the digestive functions, its acid-combining power, and low degree of acid stimulation.

Gelatine preparations made from fresh orange, lemon and strawberry juice with the degree of heating commonly employed in the household showed essentially the pronounced antiscorbutic action of the fresh juices themselves. Scurvy in guinea pigs was readily overcome by small amounts of such preparations.

A study was made of the indican and phenol elimination of a normal man on a diet, the protein portion of which was supplied by gelatine. Knox gelatine was used in this as in the other tests, 72 grams per day being given for five days. In another period a meat diet was given. The indican output fell from 8.25 mg. on the last day of the meat period to 0.70 mg. on the last day of the gelatine period. Total phenols fell from 506 to 193 mg. The period averages were 474 and 331 mg. respectively. The decreases in indican and phenols were probably due to the low content of gelatine in tryptophane and tyrosine.

129 (2089)

The cultivation of the organisms of rocky mountain spotted fever and typhus in tissue cultures.

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In these experiments tissues from infected adult guinea pigs were grown in plasma obtained from normal guinea pigs. With

* This paper was read at the meeting of the society held on January 17, 1923.

Rocky Mountain spotted fever the bits of tissue were taken from the tunica of the testes. With typhus the cerebral cortex was used. The plasma was obtained from adult normal guinea pigs by centrifuging chilled blood collected in paraffined tubes.

Our results with spotted fever prove that the virus survives and multiplies in such cultures. Evidence of survival of the virus was obtained by causing the disease in guinea pigs by injecting the cultures intraperitoneally. Although the spotted fever reaction is very characteristic, the results were controlled by histological studies or by subsequent immunity tests.

Evidence of multiplication of the virus was obtained by demonstration of the minute paired micro-organism of the disease (Dermacentroxenusrickettsi) in increasing numbers in first generation cultures up to about the fourteenth day. The micro-organisms are always intracellular, in large amœboid phagocytic cells of endothelial origin.

The accompanying table shows the duration of survival of the micro-organisms in first "generation" cultures, experiments of August 17, October 10 and October 24, and the prolongation of this period by transplanting the cultures into fresh plasma; experiments of October 31 and November 7.

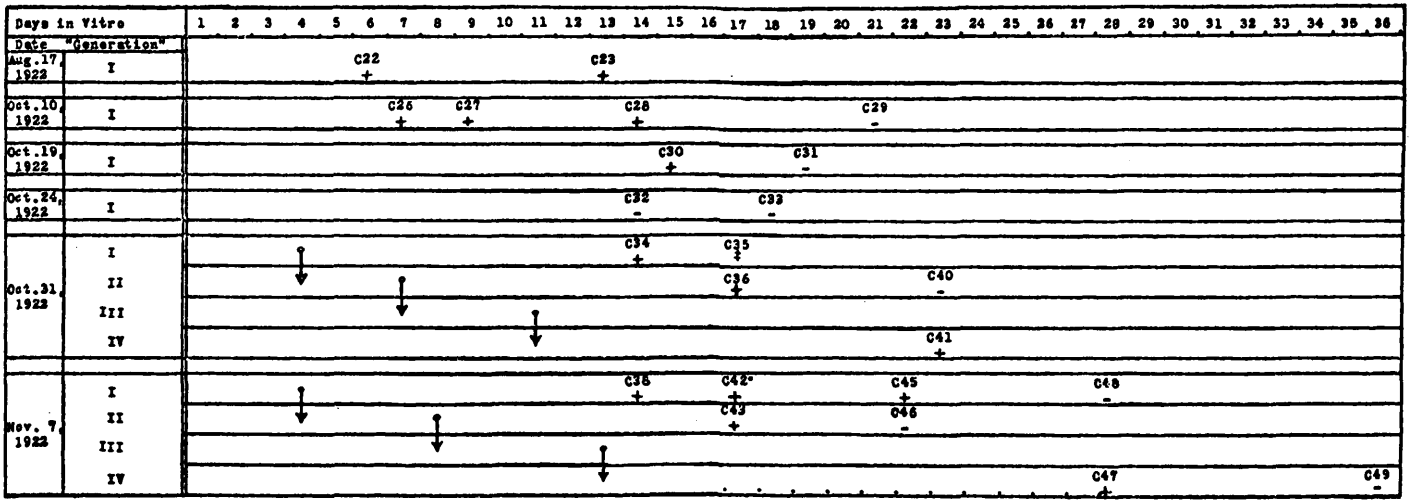
The examination of cultures fixed in Zenker's fluid, sectioned and stained with Giemsa's stain, shows that the period of survival of the micro-organisms corresponds to the length of survival of the cells of the culture. Initial multiplication of the micro-organisms takes place in situ in endothelial cells of blood vessels, and continues in wandering cells of the same origin.

In addition to the forms of the micro-organism previously described, filamentous forms are occasionally found resembling those of *Rickettsia prowazeki* as seen in infected lice.

With typhus we have not completed experiments beyond first "generation" cultures. Guinea pigs inoculated after eight, eleven and fourteen days incubation of the cultures have acquired typhus, as was proved by typical temperature reaction plus characteristic lesions in the brain or immunity.

Micro-organisms consistent with *Rickettsia prowazeki* have been found in sections of the brain cultures within large wandering amœboid cells; but their demonstration is attended with the same difficulties in these tissue cultures as in sections of fresh tissues with lesions. The examination of sections of the cultures shows that the surviving cells in these brain cultures take

Rocky Mountain Spotted Fever



EXPLANATION OF TABLE.

The arrows indicate transfers of the tissues or fragments thereof into fresh plasma.

‡ Indicates an atypical reaction followed by immunity to subsequent inoculation with spotted fever blood.

Guinea-pigs C22, C23, C27 were killed.

Guinea-pigs C26, C28, C30, C34, and C43 succumbed to the infection.

Guinea-pigs C35, C36, C38, C42, C45, and C47 survived the infection.

origin in blood vessels and meninges. Nerve cells and apparently neuroglia cells do not survive. The wandering amœboid cells we believe are of endothelial origin.

The well-known vagaries in duration of incubation periods and intensity of temperature reactions of typhus in guinea pigs render progress slow in these experiments. Our results so far prove that the micro-organism of typhus survives in first "generation" tissue cultures up to fourteen days.

These experiments with both diseases are being continued and extended, and in the case of typhus with other tissues than those of the central nervous system.

130 (2090)

The endothelial factor in anaphylaxis.

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If the lungs of a normal dog are perfused with Locke's solution, followed by Locke's solution containing 0.25 per cent. to 1 per cent. horse serum, no recognizable pulmonary reaction takes place. The rate of perfusion flow remains constant on changing from Locke's solution to the dilute serum. The lungs collapse normally on releasing the tracheal clamp. No frothy fluid escapes from the trachea.

If the lungs of a sensitized dog are similarly perfused, marked pulmonary reactions occur. These reactions are:

(a) A 75 per cent. reduction in the rate of perfusion flow. This reduction reaches its maximum by the end of two minutes, with slight tendency to recovery after the third minute.

(b) An increase in the size and consistency of the lungs, with non-collapse on release of the tracheal clamp.

(c) The escape of large amounts of fluid from the trachea on releasing this clamp. If the perfusion is now continued,