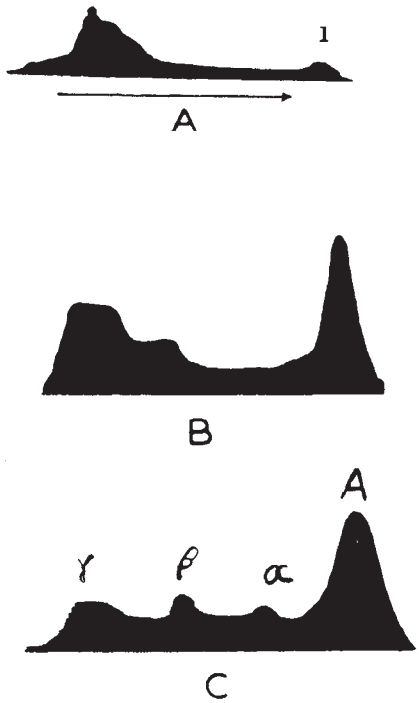

Fig. 3. Electrophoretic patterns of: (*A*) normal mouse leg extract; (*B*) extract from legs 1 hr. after release of 2-hr. tourniquets; (*C*) mixture of normal tissue extract (5 parts) and normal serum (1 part)

obtained by combining normal tissue extract with normal serum. The dissimilarity of Figs. 3*B* and 3*C* indicates that the extract from the injured leg is not a simple mixture of serum and tissue proteins. The data of the table indicate that there is as much protein lost from the injured area as there is gained. The patterns obtained on the serum of animals in shock also indicate a large gain of proteins having low mobility. By means of photometric and ultracentrifugal analysis, it was found that the new proteins in the serum consisted of tissue proteins, hæmoglobin, and products of digestion. It was further shown that hæmolysis occurs when fresh tissue is mixed with whole blood or separated erythrocytes. If the tissue is not fresh or has been heated, hæmolysis does not occur. Logaras[16] has shown that urea inhibits the severity of shock following the release of tourniquets in rats. We have shown that 0·04 *M* urea in 0·11 *M* sodium chloride inhibits the lysis of erythrocytes by fresh tissue.

The details of this work will be published elsewhere.

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OBITUARIES

Prof. F. W. Twort, F.R.S.

PROF. FREDERICK WILLIAM TWORT, who died on March 20 at the age of seventy-two, will rank as one of the major workers in bacteriology on account of his discovery of the bacteriophage.

Born in 1877, the son of Dr. William Henry Twort, he qualified M.R.C.S., L.R.C.P. from St. Thomas's Hospital in 1900. His bacteriological career started forthwith, first in the clinical laboratory at St. Thomas's, then at the London Hospital, and finally, during 1909–44, as superintendent of the Brown Institution, University of London. His first major contribution to bacteriology was the study which he and G. L. Y. Ingram made of the etiology of Johne's disease of cattle. In 1910, they isolated the *Mycobacterium* known as Johne's bacillus by the ingenious method of growing it on a medium containing heat-killed bodies of other acid-fast bacteria. They further showed that the growth-factor present in acid-fast bacilli is widely distributed in other substances such as various fruits, linseed and a fungus; but they were unable to identify it chemically with certainty. Twort also demonstrated allergic reactions in diseased cattle by means of extracts of his cultures, paving the way for the later development of the Johnin test.

The discovery of bacteriophage, or 'bacterial virus', was outstanding. Twort first detected bacteriophage action in colonies of staphylococci isolated from vaccine lymph. He published his first observations in 1915, but was unable to follow them up at once on account of the First World War, in which he served as officer-in-charge of the base laboratories in Salonika and as bacteriologist to the Northern Ireland Command.

Twort at first, and for many years, regarded the nature of bacteriophage as unsettled. He considered from the first the analogy between bacteriophage and viruses, but kept an open mind on the question as to how far the analogy should be pressed, on the evidence then available.

D'Herelle's extensive researches on bacteriophage (for the name of which he was responsible) followed Twort's original discovery in point of time, and d'Herelle's interpretation of the phenomenon from the first corresponded more closely to present-day views; d'Herelle's publications attracted more immediate attention than Twort's first paper had done, so that d'Herelle's name is commonly associated with Twort's in the description of bacteriophage as 'the Twort–d'Herelle' phenomenon. Nevertheless, the priority of discovery was Twort's, and there are some aspects of bacteriophage behaviour which to this day leave open a possibility that the analogy between bacteriophage and virus can be pressed too far.

Twort's contributions to bacteriological science were recognized when in 1929 he was elected a fellow of the Royal Society, and by the conferment of the title of professor of bacteriology in the University of London. He leaves a widow, a son and three daughters.

Prof. R. A. S. Macalister

THE death of Prof. R. A. S. Macalister in his eightieth year brings to an end an unusually long, varied and distinguished career of archæological teaching and research. Son of the anatomist, Prof. Alexander Macalister, R. A. S. Macalister entered his