Front cover: *Historical remarks to the Institute for Chemical research(ICR)*

The chemical structure shown on the front cover represents cellulose which is a raw material of Viscose Rayon, the first man-made fiber.

In the late 1930s, during the course of studies being made of the development of a new two-bath stretch spinning process of viscose fibers, the late professor Masao Horio and his collaborators succeeded in producing a viscose rayon staple with a fine crimp similar to that of wool at the Horio Laboratory of the Institute, Takatsuki, Osaka (at that time). The cross section of crimped rayon staple can be distinguished with two different parts by a boundary line x, as shown in Fig. 1 a and b. The upper part A shows finer serrations and is characterized by a thick skin. On the other hand, the serrations of the lower part B are coarser and deeply notched, and the skin is thinner. Such a structure they called "bilateral structure". The motive force of the crimp formation is the coiling nature of fibers coming from the bilateral structure. The total shipment of rayon staple of Japan in 1963 was 284,000 tons, of which about 186,000 tons were the crimped staple manufactured by the process developed by Horio et al.

Wool is a typical bilateral fiber which is composed of an acidic part (para-cortex) and a basic part (ortho-cortex) (Fig 2). This dichotomy of the wool fiber was also first realized by Horio et al., although later these terms were more generally called as "paracortex" and "orthocortex".

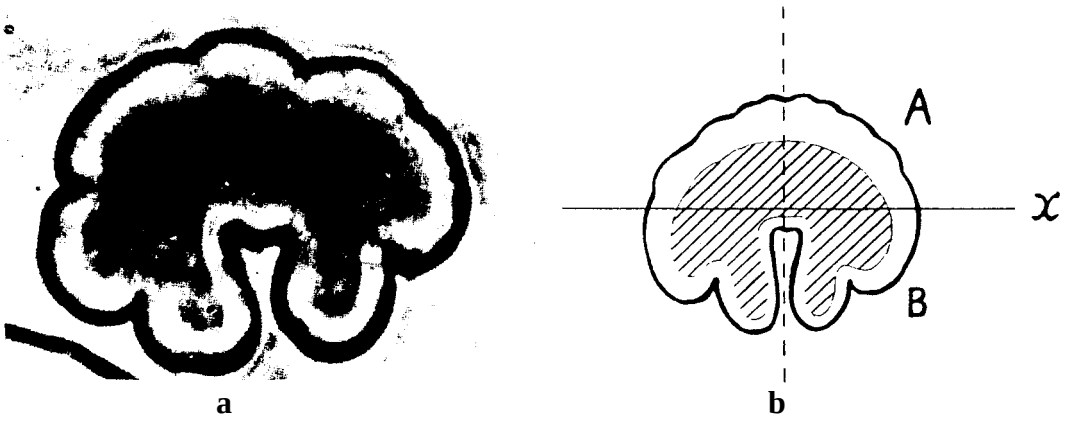

Fig 1. (a) Cross section of standard crimped rayon staple. (b) Schematic representation of a cross section of a standard crimped staple. x = boundary line.

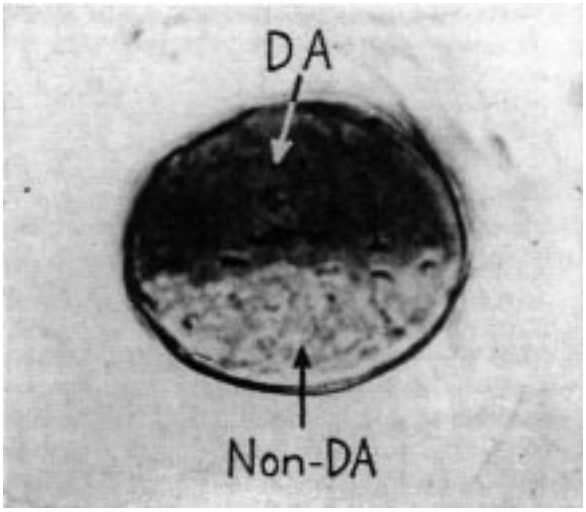

Fig 2. Differentially stained cross section of a wool fiber by Janus Green. DA : Dye-accessible (paracortex), Non-DA : Non-dye-accessible (orthocortex).