INNOVATION, INVENTION & FAILURE: THE CASE OF REGENERATED PROTEIN FIBRES

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Creating a warm, soft, comfortable, physically functional and economically viable man-made fibre which would be equivalent to wool, a natural protein fibre, or a parallel to the regenerated cellulose fibres which imitated silk has been a goal for textile researchers and entrepreneurs since at least the nineteenth century. This research was the first contemporary study of a group of significant but largely forgotten and under-researched regenerated protein fibres. The resulting thesis addresses questions such as what these fibres were, how they were developed, produced, marketed, used and by whom as well as why they have been actively forgotten. Regenerated protein fibres are considered using models of invention and innovation proposed by Usher and Schumpeter. Analysis of technological innovation is normally focused on analysis of success but this thesis is unusual in evaluating textile innovations which are considered to have failed due to their significant technical problems. The nature of this failure is explored, including a discussion of the contemporaneous cultural pressures operating within a complex and changing political and economic context. An alternative model, that of substitute innovation, is proposed.

Three generations of regenerated protein fibres may be identified. First generation fibres were developed in the late-nineteenth and early-twentieth centuries while the search for a wool substitute became dominant in the mid-twentieth century, due to the political and military build-up to the Second World War (1939-1945). A third generation of regenerated protein fibres has been in development since the late-twentieth century. The contribution of the major innovators, researchers and entrepreneurs, such as Millar, Todtenhaupt, Ferretti, Atwood, Boyer and Ford, is discussed together with a detailed historical and technical survey of fibres made from animal and vegetable sources such as corn (zein), milk, peanuts and soyabeans. Primary and secondary sources, including the relatively few surviving artefacts, patents, contemporaneous textile literature and visual sources, are analysed for their value in understanding the trajectory of these fibres. This includes the use of these fibres in high street and couture fashion and the promotion of Aralac (milk fibre) by National Dairy in America and Ardil (peanut fibre) by ICI in England. A survey of advertisements and manufacturers is included. The routes by which the development, marketing and consumption of these fibres became politicised are explored. The development from initial modelling of regenerated protein fibres as part of the modernist project into a patriotic emphasis with unsettling links to Fascism is examined. Thomson's 'rubbish theory' is employed to illuminate changing cultural attitudes to these highly politicised substitute wartime materials but also, more specifically, to museum curatorial practices in the collecting synthetic and substitute materials which have had the effect of creating bias in the physical record of modern material culture.