

Shoes made of rumen – in the search of substitute materials during WW II

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In Zlin one gets naturally accustomed to facing various proofs of the unique story of the Bata shoe factory. On the contrary, finding one of such proofs in the Cabinet of veterinary and pharmaceutical history in Brno - which is part of the Veterinary and Pharmaceutical University (VFU) - is rather surprising. Among many veterinary tools and objects illustrating history of veterinary medicine there are two pieces of women's shoes made in the 1930s. They were donated to the Cabinet by Doctor Jan Hökl.

Doc. MVDr. RNDr. Jan Hökl (1907 – 1951) was born in Brno but in 1939 he came to Zlin due to family and political reasons just like many other specialists that sought for either job or safety – or both – in that prosperous and modern city called “Czechoslovak Detroit”. He was hired by the Bata Company to work in the newly established Biological Institute and later in the Institute for Research of Animal-origin Foodstuff. We may be quite surprised to hear that a shoe company hired a top specialist on bacteriology, pathological anatomy and parasitology, but Bata had its good reasons. Hökl was also involved in the project „Patagonia“, which was established to find new sources of leather for the Bata's world's largest tannery in Otrokovice near Zlin. Besides, Doctor Hökl's main target during the war was control of non-toxic and harmless food and water for the whole city of Zlin.

In addition to all of those tasks he was very interested in substitute materials for shoemaking. He was not the only one. Due to the war many business contacts of the Bata Company collapsed and the factory pretty soon faced shortage of leather. To fully understand the situation, we need to remember that in the early 1930s some 140 000 pairs of shoes used to be made in Zlin daily. For such huge amount of production the factory needed daily 5 000 pieces of bovine hides, 15 000 pcs of calf and goat hides plus annually some 500 – 800 million meters of threads and 10 million square meters of fabric¹. By the end of the 1930s the numbers even increased – the factory in Zlin produced 180 000 pairs of shoes every day.

¹ Erdély, Evže. Švec, který dobyl světa. Zlin 1990. Archa. 192 pgs. ISBN:59-078-90

Therefore the company carefully observed research of substitute materials worldwide. In 1940 the Bata magazine *Obuv – Kůže – Guma* (OKG) (Footwear-Leather-Rubber) published an article that praised good quality and unlimited sources of shark skins and mentioned Japanese shoemakers that produced 2,5 million of pairs made of that material. The article also considered dolphin skins for possible use or hot novelty of the US market: frog and fish skins used for home slippers, wallets or small shoe decorations².

Later in 1940 a more useful idea appeared in the same magazine, inspired by the magazine *ABC der Schuhfabrikation* - shoes with wooden outsole. The Bata company found the idea so promising that the very next year a new product was introduced to the market – women's sandals with split wooden outsole and with uppers made of cheap colorful fabric. The clogs became immediately very popular.

Some other articles illustrate the depth of the raw material crisis of the shoemaking industry. „*Milk as a source of fabric*“³ or „*Imitation of leather made of human hair*“⁴ can be beaten only by an article of doctor Hökl which asked the readers „*Could rat skins be of any use?*“⁵. One of the employees of the Bata company reported on June 9, 1941 that in Vienna „... *clogs are sold on rate-tickets base in the shops, here and there a pair of straw or bast mules are available*“.

Desperate times call for desperate measures. Therefore Dr. Hökl and his co-workers tried to obtain leather substitute from bovine and sheep stomachs. They built the idea on the work of the French René Planchon⁶ who recommended that source as early as in 1931. Back then it seemed to be useless but the war changed perspective. Dr. Hökl carried out detailed research and published the results, first in *Veterinary Horizons* in 1939 (32/1939, p. 505-508) and later in *OKG* (1/1940, p. 1-3).

In the articles Dr. Hökl stressed out pros of that untypical material: reticulum of sheep stomach offers irregular net pattern, bovine rumen is covered with small scales that do not disappear during tanning process. Moreover, the rest of stomach tissues can be used as

² Skins of sea animals. *Obuv – Kůže – Guma*. 1940, No. 12, p. 318. Zlin.

³ Milk as a source of fabric. *Obuv – Kůže – Guma*. 1940, No. 4, p. 133. Zlin.

⁴ Imitation of leather made of human hair. *Obuv – Kůže – Guma*. 1940, No. 5, p. 165. Zlin.

⁵ Hökl, Jan. Could rat skins be of any use? *Obuv – Kůže – Guma*. 1939, No 5, p. 180. Zlin.

⁶ Planchon, René. *Traitement industriel et rationnel des sous-produits d'abattoirs*. Paris. 1931.

food. The material can be easily colored in bright colors and its price could be compared to that of sheep leather, the cheapest of animal leathers. Plus, one bovine rumen can provide 1,5 – 2 square meters of material. Of course, there were also cons. First, the material was hard to obtain – peeling of inner layer of rumen requires lots of strength and skills. Second, tanning was rather difficult and third, quality of the final product was low due to presence of collagen connective tissues and elastic fibers. Considering all those pros and cons, Hökl recommended the substitute both for home and luxurious footwear, whole and/or parts, plus for production of handbags.

The research was accompanied by pictures of two shoes. In fact, presenting the results of research without any real example of contribution to the company's interest would encounter displeasure of the directors and thus no further support of the research. Both of the shoes were made of bovine rumen tanned with tanbark and red dyed. We can only assume that they were made by the Bata Company because there is no brand on them. They were made in the late 1938 or early 1939 since their pictures illustrate the above mentioned article in 1939.

There is a well-visible code inside on the lining in one of the shoes (model A): B 12 4035 F 3 ½ with 28 12 4 05 below. Typing and style corresponds with the codes that were used by Bata as we can easily read for example on a luxurious model of women's black low-heel shoe which was part of a collection made by Bata for the 1939 World EXPO in New York. The shoe is marked B 13 0005 F with numbers 12 3 20 below. There is no evidence that the rumen shoe was part of the New York collection but a gilded stamp of the Statue of Liberty on its insole may indicate possible connection. Numbers in the other shoe (model B) are almost invisible.

Model A represents a low-heel women's shoe with lacing. The original bright red color that doctor Hökl reported in his article in 1939 has faded to liver brown due to time and not very standard conditions in the Cabinet in the past decades, as well as the model B, but their small scales still give the material very unique look. Design of the model A is very modern, some may even say extravagant. Four parts create the upper of moccasin style, the edges are trimmed and give the shoe even more luxurious look. There are two holes for a lace; the original one was - we don't know when - replaced with a piece of cheap leather strap. The

outsole is made of leather as well as the heel. The massive welt is decorated with red and white crosses made of thin strips of red and white leather. This decoration had to correspond beautifully with the original red color. The same pattern is used on the heel, too, which again makes it refer to the New York collection because two of the New York models were also decorated with color leather straps on heels and welt.

Model B looks more humble. A women's Derby on low heel with leather lining has also trimming on the edges of each part. Atypical metal eyelets were used as the main decoration; the original leather lacing strap has small tassels on its ends.

Both the models profit from the unique effect of the stomach leather. The small scales soaked more of red dye and therefore difference between the color of the base and that of the scales is quite evident even today.

Both of the models can be found in the Veterinary and Pharmaceutical University in Brno. Both shoes look pretty well considering their age and the fact that they survived a burst of water pipes in the Cabinet which was completely flooded in 1970s. After more than 70 years they serve as a genuine proof of invention and smart use of substitute materials during the World War II and even today they may also serve as an inspiration for the search of substitute and ecological materials.
