

The Current Importance of Peat Textiles*

On April 26, 1986, a nuclear reactor exploded in Chernobyl in the Ukraine. During the days and weeks that followed radioactive clouds spread across large parts of Europe. Every particle of dust in this cloud, which measured over 1000 m in height, carried radioactive material: large amounts of Iodine 131, which has an affinity with the thyroid, especially in children and younger adults; Strontium 90 with its inclination to settle in bone in place of calcium; and Cesium 137, which concentrates in muscles in place of potassium. All of these are carcinogenic and cause damage to cells. Many people have seen the impressive pictures of the cloud mass gradually spreading across the European sky. However images based on radiation measurements for such death-dealing rays are invisible to the human eye. Like a fiery torch this apocalyptic horror passed over the blue skies of Europe in May 1986 undetected by any human sense organ.

The effects were detectable in Germany only few days after the catastrophe: radioactive pollution settled in fields and streets. Vegetables, salad plants and milk had to be avoided because they were polluted

with radioactive particles; play areas and sports grounds were closed for the same reason, and children were not allowed to play outdoors.

Everywhere people were justifiably anxious about coming into contact with deadly substances and sought to protect themselves against the radioactivity. Confusion was the order of the day since the relevant authorities were unable to form valid judgments or set suitable guidelines. Specialists in this field who might have been consulted by the authorities were in many respects out of their depth or put forward conflicting opinions. Safety statisticians had predicted something like this might occur in the distant future so no one knew what was going on. Fear and misinformation drove people to overreact or even take the wrong kind of precautions.

Fear also prompted people to take action with regard to the use of peat products and textiles. The longer the fallout lasted, the greater the demand for peat textiles. Juliane Endlich published details concerning the post-Chernobyl situation and the use of peat fiber textiles in *Mensch und Kleidung* Nos. 27 and 28.¹ Below, a closer look is taken at the limitations of peat fibers, and we shall also show the ways in which they can be useful, for example as a filling for duvets, or in rugs, mattress covers or clothes.

Source and development of peat fiber

Peat fiber is a constituent of sheathed cotton sedge *Eriophorum vaginatum*

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growing in bogs and boggy soils. Raised bogs always develop on soils with little mineral content where there is almost no drainage. Rainwater collects as though in a bath tub that gradually fills up.

Few plant families survive in such conditions; the original vegetation – trees, bushes, or even whole forests – gradually perish over the centuries: they become peat. Only mosses, heathers and a few grasses survive on the surface in these conditions – plants with few needs as regards warmth and nutrients, and even these gradually become submerged in the water. Sphagnum mosses are the only plants that flourish in these conditions. They grow over everything, including themselves, creating a layer of vegetation from which new shoots constantly appear; new plants create further layers on top of the dead bodies of older vegetation.

Over many years a spongy mass of vegetable matter develops. Increasing in thickness it will in the end absorb 25 times its own weight in water. The surface of these raised bogs is noticeably higher than the surrounding ground, hence their name. Sunken bogs are flatter, as the name implies; they contain more nutrients and therefore support a richer assortment of plants such as birch, alder, sedge and bent.

Sheathed cotton sedge favors raised bogs where it constantly dies down and then regrows. Peat fibers are obtained from the light-colored peat nearest the surface of the bog. The black peat lower down contains

almost no recognizable plant remains. Its dark color foreshadows the process in which it will gradually turn into coal.

Peat development is neither decomposition, with microbial activity converting organic into inorganic matter in the presence of air and water, nor the result of putrefaction, with bacteria ultimately converting organic matter into sludge in a process that also generates CO₂, water, and gases such as hydrogen and methane. Peat develops once the upper layers of vegetation have died when a lengthy process begins in which microbial action takes the organic matter through many chemical stages before it turns into humic substance systems. Despite their lack of structure these are relatively stable mixtures of substances on the way to becoming coal, with some very special properties.

In peat, the ascending (etheric) forces in the remaining life processes of the vegetation are met by descending death processes that cause the vegetation to disintegrate. Hence Rudolf Steiner's general suggestion to his colleagues: "In peat the ether forces have a descending tendency; this must be transformed into an ascending one." In his book *Fundamentals of Therapy* we read: "This divides plant nature into two aspects. One is oriented towards life, it is wholly in the sphere of the periphery; these are the sprouting organs that sustain growth and flower. The other is oriented toward the lifeless, it remains in the sphere of outward radiating forces, it includes

everything that hardens growth, providing a firm supporting structure for life, etc."² Such is the stream of substances in which the lifeless comes to life and what is alive dies; plants exist within such a stream.

Raised bogs develop when plants live in an ongoing process of excessive new growth and dying. In addition, raised bogs are in the form of mounds. According to Rudolf Steiner, for example in the lectures on agriculture given in Koberwitz in 1924,³ mounds are particularly good at absorbing the cosmic forces from the periphery. Centuries of stored forces of growth and development from an originally healthy, vital natural world free of environmental toxins are imprisoned in peat fibers.

Characteristics of peat and peat fibers

A number of physical and chemical properties can be deduced from what has been stated above regarding the development and composition of peat. For a wider understanding of all the effects, however, we shall, have to base ourselves on points of view gained from Rudolf Steiner's spiritual science. We can assume that much of what can be said with regard to peat also applies to peat fibers, since these are a constituent of peat.

Peat preserves not only ancient oak boles, tree coffins or corpses, but fruit and vegetables laid in peat also stay fresh longer. Decomposition and putrefaction of organic matter are not only prevented by lack of oxygen and acidity; certain substances and forces

present in peat also counteract decomposition. Compost heaps should be covered in a layer of peat. "This would effectively protect the conversion processes in them from disruptive outside influences," said Rudolf Steiner in the above-mentioned lectures on agriculture. A covering of peat also helps to preserve the processes and activities of biodynamic preparations. Although it may make the garden soil more friable when dug in, it is liable to hinder the stream of substances in plant growth and can even be harmful. It should not be regarded as a fertilizer, for left in its natural state it has absolutely no fertilizing effect.

(A discussion of its suitability as a filler and for insulation in healthy domestic architecture goes beyond the scope of this article).

Peat provides warmth

The warming, vitalizing effect of peat has been used for a long time in the treatment of rheumatic or sclerotic conditions. This is due to the high specific heat of the humic substance system; such heat is easily stored.⁴ It goes without saying that individual reactions must be taken into account when medicinal peat products and preparations are used. The same goes for the wearing of peat fiber textiles, which will be discussed below.

This brings us to the advantages of healthy clothing. We all know the discomforts of wearing easy-care synthetic textiles that quickly make a good many of us perspire and smell. This generally happens because heat

is trapped by fibers that cannot ventilate adequately or which lack the ability to absorb moisture. Peat textiles do not have these disadvantages.

Peat absorbs moisture

Peat has a low specific weight so the fibers are loosely woven and lightweight. They absorb moisture because of the colloidal nature of the humin in the fibers. They act like a sponge, and absorbed water can be squeezed out again. It is also the humins that make the textiles specially efficient at binding odors, sweat and salts.

Peat fibers can easily be spun with wool and 40 or 50% peat has proved a good proportion in a wool-peat mixture. The properties of peat still apply in such mixtures or else the peat complements or increases the properties of the thread with which it is spun.

Flammability and electrostatic charge

Peat fibers burn almost as badly as wool; they just glow or glimmer. Synthetic textiles on the other hand can generate high temperatures when burning, and they also release toxic gases. There is almost no electrostatic charge in peat fibers.

Peat and solar radiation

Textiles containing peat fibers give warmth in a highly specific way. This might also involve a heat-activating process triggered when high-energy light is converted to long-wave heat radiation by the brown humin sub-

stances.⁴ Heat and light, which are essential for life, are in continuous wave motion. Light has very short wavelengths, and those of UV light are even shorter. Light with especially short wavelengths damages proteins and thus cells. Human skin transforms short-wave into long-wave radiation with the help of endogenous melanin. Melanin, which is related to the humins, is the brown skin pigment we know as freckles. It is produced by melanocytes as a protection against the UV radiation constantly reaching the earth from the sun. We protect ourselves against this inimical, cold and invisible radiation by increased sweat secretion (sweat also contains substances that absorb UV radiation) by producing our own active substances (enzymes) which immediately repair cell damage by increasing cell production (horny layer of skin), and by the all-important synthesis of skin pigments.

The existence of inimical radiation brings us to the current importance of peat fiber textiles for clothing. UV radiation from the sun and outer space has hitherto mainly been held in check on its way to earth by a protective ozone layer. We know that this is subject to growing damage through industrial use of CFCs, so that exposure to UV radiation is on the increase.

The types of radiation reaching the earth from space and from the sun are: radio waves, heat, light, UV light. Wavelengths are progressively shorter in this sequence, reaching zero in X-rays which come next. From this

point, more or less continuous radiation turns into the crackle of the Geiger counter caused by gamma, beta and alpha rays: radioactive radiation. The chemical actions of UV light in cells become destructive when X-rays or radioactive rays reach cell tissue.

Radiation damages the DNA in cell nuclei, causing irreparable damage and cell fragments the removal of which has toxic effects on the body. Almost exclusively young, growing tissues are affected or tissues that reproduce rapidly, such as blood cells, reproductive cells, or the cells in the intestinal walls. This is why children are particularly threatened.

Peat fibers in clothing

A healthy constitution will to some extent resist radiation damage or cope better, which is why a physiologically and psychologically healthy lifestyle is so very important. Natural clothing can have a place in such a lifestyle, and this is where textiles containing peat fibers come into the picture. Peat products in bedroom and living room also have their place. Direct protection against radiation, however, is only provided by proper protective clothing.

Peat and human skin

The antibacterial properties of peat products are directly due to solutes in the peat. Open wounds heal more quickly and are less likely to become infected, which is also partly due to the acid pH of bog water.

Textiles containing peat fibers provide us with a protective layer

that corresponds in some ways to our own physiological protective layer, the skin. Peat fibers, stemming as they do from a grass, contain a lot of silica resulting from the high silicic acid content of sheathed cotton sedge. Silica, SiO_2 , is quartz. Quartz, in turn, has a strong affinity to light, to the cosmic environment surrounding us all. On the other hand, the humin system belongs to the dark carbon. Peat fibers' affinity to light and repulsion of light both react to external stimuli. Human skin, too, contains relatively large amounts of silicic acid, and in the melanin-producing pigment cells we have a process similar to the humin system.

The above-mentioned skin substances also react to external stimuli by triggering an appropriate reaction in the relevant defense system. It is therefore easy to understand why textiles containing peat fibers can lend a helping hand to our own protective skin layer in its efforts to ward off harmful influences from outside.

Peat supports the life forces

Life forces need warmth. Textiles containing peat fibers provide warmth in a specific manner. Life forces need activating wherever damaging influences exercise their inhibiting effects. Textiles containing peat fibers are thus doubly useful: as a prophylactic measure for healthy individuals, and as a support to help the sick regain health. W. Dethloff put this succinctly in an article on our three-layered protective covering: "... debilitated life forces need plant fibers (linen, cotton,

etc.)."⁵ We can confidently add peat fibers, even though the resulting textiles are not as soft as those made from wool or silk.

History of peat fiber processing

Henry Smits gave a very interesting lecture in Stuttgart on 26 November 1960 in which he referred to the few remarks made by Rudolf Steiner about peat. As a young man he had been employed by an organization called *Der Kommende Tag*, an association of several firms including a research institute. In Guldesmuehle in 1920, Steiner had suggested to Smits that the fibers of sheathed cotton sedge found in the peat of raised bogs could be made spinnable. Textiles woven from such yarn would be warmer and stronger than those made from wool and would also provide some protection against radiation.

Since then there have been repeated attempts to produce fibers according to the indications given by Rudolf Steiner. H. Smits himself achieved the first positive results. Subsequently, however, no one succeeded in producing a usable textile by the method Steiner suggested for the treatment of peat fibers.

Johannes Kloss has been trying to process peat for years in this way without any success. With endless patience and perseverance, accepting extensive financial losses, he has succeeded in developing a technical process that makes it possible to extract the fibers from peat and process them to obtain a substance that can be carded and spun with wool.⁶ Fragments

of fiber and moss particles will shake out of the mixture, but after this the textile has all the advantages described above.

Johannes Kloss's extensive machinery is located in a former fiber-board factory in Rydoebruk, a small village in Sweden. This is where he has been living for the past 30 years, and he is happy to answer questions about the production and use of peat fibers by mail: Johannes Kloss, Stora Lahult, S-31071 Rydoebruk, Sweden.

The firm Torfpost in Holland specializes in producing and supplying products containing peat fibers, particularly textiles for clothing and bedding.

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References

- 1 Endlich J. Tschernobyl und die Torffaser. *Mensch und Kleidung* No. 28, 1986, pp. 24-26.
- 2 Steiner R, Wegman I. *Fundamentals of Therapy* (GA 27). Tr. E. Frommer, J. Josephson. London: Rudolf Steiner Press 1983.
- 3 Steiner R. *Agriculture* (GA 327). Tr. G. Adams. London: Bio-Dynamic Agriculture Association 1977.
- 4 Ziechmann W. Die Struktur der Huminstoffe und ihre physiologischen Eigenschaften. *Erfahrungsheilkunde* 1979/3, pp.133-140.
- 5 Dethloff W. Die dreifache Huelle - vom Urbild der Bekleidung aus der Sicht einer differenzierten Materialkunde. *Mensch und Kleidung* No. 15/16, 1982/83, pp.28-30.
- 6 Kloss J. *Deutsches Textilforum* No. 1/1983, ISSN 0722-1258, D-Hanover 1, P.O.B. 5944.

Also

von Grumkow, K. Die Entwicklung der Torffaser und ihre Rohstoffbasis in *Mensch und Kleidung* No. 19/20, 1982/83, pp.41-42.
 TELMA *Berichte der deutschen Gesellschaft fuer Moor- und Torfkunde* Vol.13, 1083; Vol.14, 1984; Hanover.

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