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Introduction*Peter Zwick*

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History of the Limnologische Flussstation Schlitz

After World War II, Germany was divided into four occupation zones and free travel to neighboring countries was not possible. At that time, the Rivers Weser and Fulda formed the only major German river continuum that was accessible over its entire length. However, most of the second constituent tributary of the Weser, the River Werra in the Soviet Zone, was inaccessible. Therefore, the Fulda and Weser were the natural choice as study objects for a group of five biology students at the University of Göttingen who hoped to found an institute dedicated to stream limnology.

Martin Scheele, Joachim Illies, Wolfgang Schmitz, Karl Müller, and Ernst-Joseph Fittkau received local support from Prof. Demeter Beling and Dr. Adelaide Beling, German ichthyologists and microbiologists who had previously worked on the Dnjepr in Russia. Prof. August Thienemann, head of the famous Hydrobiologische Anstalt der Max-Planck-Gesellschaft (MPG) at Plön, soon became mentor and supporter of the enthusiastic group.

In 1949, the Belings and the five students sampled the River Fulda during what became a real expedition, under the adventurous conditions of post-war Germany. The group made contact with sport fishermen at Schlitz who expressed interest in, and eventually funded, an exhibition of freshwater fauna and flora entitled “*Das Leben unserer Heimatgewässer*” which was shown in the sportshall at Schlitz, in the autumn of 1949. The illustrious Otto Hartmann Graf von Schlitz, genannt von Görtz, visited and decided to provide the young students with a building to serve as a base for further studies of the River Fulda. He had his sculptor grandfather’s former studio (first built in 1876) completely rebuilt and donated this plus some land and fishing rights to the MPG (Figure 1.1).

The opening ceremony of the Schlitz institute was held on 4 June 1951, in the presence of Count and Countess v. Görtz, Otto Hahn, President of the MPG, A. Thienemann from Plön, D. v. Denffer of the Justus-Liebig-Universität at Giessen, and many other guests. The choice of name, “*Limnologische Flussstation*”



Figure 1.1 The original building of the Limnologische Flusstation in 1951, and the name plate on its front wall.

(Figure 1.2)¹⁾, anticipated a change in scientific emphasis, which manifested itself years later when the long-established Hydrobiologische Anstalt at Plön became the Max-Planck-Institut (MPI) fuer Limnologie.

J. Illies held the single scientist's position at the Limnologische Flusstation Schlitz, but the salary was shared between the five founders until the other four found themselves different positions. Later, a second scientist's position was installed by the MPG. Since 1982, the payroll included 15 positions, of which five were scientists. The original building soon became too small. In 1959 the MPG added a large extension to the original building, and in 1969 Graf Otto Hartmann donated a former mill opposite the Flusstation (Figure 1.2). The MPG had the Hallenmühle transformed into a laboratory and office building. Great efforts were made to turn the millrace running through the building into a living stream laboratory. However, at that time the poor water quality of the River Schlitz precluded the maintenance of the stream fauna or any undisturbed experiments. Operating artificial streams with recirculating river water from a large reservoir was not a long-term viable alternative. Littoral filtrate of the river water was used for several years, mainly to run biofilm experiments. Eventually the room was dedicated to other technical equipment. In the main building, laboratory space was at a premium, until the MPG added a dedicated laboratory section in 1995.

The scientific activities of the Limnologische Flusstation are evidenced in the publication list, with contributions from staff members, visiting scientists, and, not least, graduate students working on master and doctoral theses. Research focused on a variety of subjects, with a change of emphasis over time.

In the first years, under Joachim Illies, the focus was on methodological studies, regional limnology and the regular sequence of characteristic biocoenoses along rivers. Much of this appeared in the *Jahresberichte* (later: *Berichte*) der *Limnologischen Flusstation Freudenthal*, the station's own periodical. The required taxonomic expert knowledge of stream fauna was largely developed by members of

1) See Fittkau (1992, 2001) for the history of the epithet "Freudenthal", further donors and additional offices operating on the Weser and so on for some limited time.



Figure 1.2 The first extension building (1959; top left) is plastered and stands at a right angle to the original half-timbered building. The laboratory section added in 1995 extends the old building longitudinally and copies its half-timbered style (bottom). The Hallenmühle (top right) stands across the road opposite the main building.

the Schlitz group themselves. Taxonomic expertise, an indispensable precondition for ecological studies, always remained a stronghold of the Flussstation.

Based on intimate knowledge of the Mölle stream in North-Rhine-Westfalia and of the River Fulda, J. Illies developed a concept of the biocenotic structure of streams (Illies, 1955), which he later extended as “*Versuch einer Allgemeinen Biozönotischen Gliederung der Fließgewässer*” (Illies, 1961). Only after organisms have been identified can their functions and roles in the ecosystem be analyzed. Illies’ (1961) concept of river zonation therefore logically preceded the *River Continuum Concept* (Vannote *et al.*, 1980). The first describes the discontinuous distribution of biocoenoses along streams, the second the continuous change of functions along river continua. Although at first glance the concepts may seem contradictory, they are actually two sides of the same coin.

From 1957 onwards, J. Illies worked in the main institute at Plön while K. Müller led the Flussstation. Studies on organismal drift and fish biology then predominated. In 1965, the Flussstation became an outlier of the new Department of Microbial Ecology of J. Overbeck at Plön. J. Illies returned to Schlitz, as Prof. Overbeck’s local representative, but because of these changes, several studies performed at Schlitz by K. Müller and collaborators were published elsewhere and are missing from our publication list (<http://edoc.mpg.de/ins/22/col/399>).

For some years J. Illies and his students resumed their studies on the River Fulda before work at the Flussstation concentrated on two, first-order streams near Schlitz. Meanwhile the River Fulda had become heavily polluted while the small Breitenbach and Rohrwiesenbach were hardly disturbed and, because of their small size, more amenable to quantitative ecological studies. In both streams, Chordata play no role and invertebrates, especially insects and amphipods, dominate. J. Illies attempted to quantify the secondary production of stream insects by using emergence traps, initiating a series of emergence trap studies. Differences down the Breitenbach required several traps along its length, at the expense of work on the Rohrwiesenbach. A general survey of the Breitenbach fauna was performed and, for some time, amphipod ecology also received special attention (M.P.D. Meijering and students, compare the publication list of the Flussstation [<http://edoc.mpg.de/ins/22/col/399>]).

In June 1982, J. Illies suddenly died. As part of J. Overbeck's department the Limnologische Flussstation Schlitz was not closed and, in 1983, P. Zwick became head of the station and chose to continue work on the Breitenbach, to fully exploit previous work done there. When J. Overbeck retired, the MPG decided to continue the Schlitz station as an independent working group of the MPI of Limnology at Plön.

The various scientific activities of the LFS attracted visitors from all continents. A few spent sabbaticals in Schlitz, but most guests were funded by the MPG, the Deutsche Forschungsgemeinschaft (DFG) or the Deutscher Akademischer Austauschdienst (DAAD), staying between one month and two years. In a few cases, external funding from the DFG was available for longer periods. The Flussstation hosted several German and international limnological congresses, until limnological associations became too large to be accommodated within the small township of Schlitz. Among other congresses held at the LFS, were the First International Congress on Groundwater Ecology organized in conjunction with the Third International Colloquium on *Gammarus* and *Niphargus* (1975), and the Sixth International Symposium on Plecoptera (1977). The Deutsche Diatomologen Treffen was initiated in Schlitz in 1987, meeting annually since then and going on to become the Central European diatomists meeting. The Rhithron Ecology Group was also founded at Schlitz (1988).

Staff of the LFS were always actively involved in academic teaching. Graduate students from all parts of Germany came to work at Schlitz for their Diploma or Doctorate. Students of the LFS were treated as in-faculty students by the universities at Giessen, Kassel, Kiel, and Marburg. Cooperation with other universities was no exception.

The choice of a successor after the retirement of Prof. Overbeck indicated that the MPG was redirecting the institute at Plön, and it has now become the *Institute of Evolutionary Biology*. When the heads of the *Department of General Limnology* (Prof. W. Lampert), the *Working Group on Tropical Ecology* (Prof. W. Junk), and the LFS retired in short succession, from autumn 2006 onwards, limnology was discontinued in the main institute and the LFS was closed, after 56 years.

The present book summarizes some of the work done on the Breitenbach by the Schlitz River Station.