Among historical construction, log buildings generally are considered to be somewhat primitive and of rustic appearance. The log building system (in German: Blockhaus) in its origin shows walls of piled horizontal trunks, which in the corner interlock with the trunks of the adjacent wall. Log buildings, however, built in many forest regions since archaic time, were appreciated by its users for the positive heat insulation properties. In the early 20th c., a sophisticated technical development of log building in Niesky (Saxony) made the Christoph & Unmack Company (C&U) a leading firm for industrialized wooden housing.

Research at the Building Department of the Hochschule Zittau/Görlitz (FH) for this paper —paralleled by an increasing general interest for C&U and its chief architect Konrad Wachsmann (1926–1929)— includes comprehensive archive studies and investigation of numerous buildings in Niesky.

After introducing historical wood housing of the region and the firm history, including works by the architect Albin Müller, the paper focuses on the structural design, especially of the «director’s house» by Wachsmann (1929). Technical problems like the high tendency of shrinking of the wood in the direction perpendicular to the trunk axis and fluctuating humidity of the wood related to the seasons, were mastered by solutions which consequently regarded the nature of wood material.

**LOG BUILDING IN THE SLAVONIC TRADITION (SCHROTHOLZHAUSER), 1500/EARLIER? – 1900**


In the middle European landscape around Niesky, including Upper-Lausitia, Silesia (Poland) and the Czech Republic, Slavonic log building was traditional. The early housing type built in the Slavonic influenced tradition are known as Schrotholzhäuser, what etymologically roots in beams which are hewn to smooth square logs, with a specific ax, called Schrotheil (later the logs were sawn). Those Schrotholzhäuser that survived around Niesky date from after 1700 (Prietzel 1997). The beams or logs show general dimensions from 18 cm x 24 cm, with a length up to 12 m. Big quantities of wood are used in this building type and the fir trees, from which these big logs were taken, must have been quite old. Since fir is resinous the logs were protected naturally against rot or worms. Starting from stones as a foundation layer, the logs are mostly put on each other without any profile. Since they were freshly hewn, after being built, during the natural drying process, they tend to take the shape of the neighbours, and this mend that only simple joint filling like fatted wool, were thought necessary to make the walls weather tight.

On the other hand the system did not suffice on the long term. The joints became uneven because of different shrinking in log parts (most in the top region
of a trunk) and this gave free play for wind and water. A dissolving of individual beam layers resulted and even real structural defeats occur, notwithstanding the thick dimensions of the parts and the repeated connections by long wooden nails.

Apart of the corner type with alternating crossing of the logs, many house corners show a smooth surface, what resulted from locking the beam ends in each other. Complicated carving became necessary for the smooth corners and yet this solution leads to exposed faces which are vulnerable for weathering.

Criticism is also inspired by the rather bad state of existing examples of the *Schrotholzhäuser*. My conclusion about this kind of log building, focussing on the mid-european climate, is: Despite complicated
corner details, they are technically vulnerable for
defects and not very intelligent in functional respect.

**SLAVONIC LOG BUILDING MIXED WITH HALF-TIMBERED STRUCTURES (UMGEBINDE), APPROX. 1520–1900** (Bernert 1988, Delitz 1987, Franke 1936, Tomlow 200b, Zwerger 1997)

In the South part of the region, another house type became popular, which shows a mix of Slavonic one-story log building with an upper story of German type half-timbered houses. These houses are called *Umgedinde*-houses, after an wooden arch structure which carries the upper story independently from the log-room of the first floor. In this way the problem of log building of big and irregular deformations in walls caused by shrinking does not harm the upper floor and roof structure. To what extent the living area, built in the log system found historically a favorable reception — without doubt for its healthy interior climate — one can recognize from such cases where in a stone noble house such log rooms were integrated (Hauserová-Radová).

Some important renewals were established, compared to the log buildings described before. The log walls of the houses were thinner — i.e. half-trunks with the smooth side outwards and cladding by vertical planks inside — and better protected than in the *Schotholzhäuser*, because of the cantilevering of the upper story. Another feature is that part of the walls is of stone in typical *Umgedindehäuser*. The reason for the stone wall is both to enhance structural stability as well as to give the house a more firm character. In other words, to give the impression that the wooden peasant hut is a «real» house. Often the entrance is a rendered stone portal with windows on both sides in a stuccoed wall. A third aspect of the stone wall parts is, that stables should be of stone rather than wood, which would not last long.

From a viewpoint of building physics the *Umgedindehaus* is a highly interesting development, which will endure as a building tradition until 1900 with hardly any change in the basic concept. In comparison
to other housing traditions, which show a range of building types for different functions, the *Umgebindehaus* is remarkably differentiated in the climatic zones inside the house: A pleasant warm living and kitchen area is in the log part, stone walls border cool rooms, the half-timbered upper story house has good conditions for sleeping, whereas the extensively used roof shows a dry space to keep things long.

**C&U Log Building 1st Phase: Firm-Catalogue Houses (Nordische Blockhäuser), 1907–1940**


So, one can imagine how accepted wood housing in this region and in Germany was. Despite its traditional image, wood still kept in early 20th c an important part of the building material market. The use of modern machinery resulted in both high-precision dimensioning of wooden parts and in an extremely fast production, compared with traditional crafts. The Christoph & Unmack wood element firm in Niesky, about 100 km Southeast of Berlin, became the world’s leading producer of prefabricated wooden houses. The vast production of Christoph & Unmack is still documented in about hundred dwellings in Niesky itself, dating mostly from 1920–1930.

The commercial success rooted in the purchase in 1882 of a patent on a barrack system, called *Döcker-Bauten* after its inventor, a Danish officer. The firm policy was, to add to the transportable barrack-like buildings of the *Döcker-Bauten* type, a complete new and huge market segment of «real» houses. Aesthetically, they wanted to give their barracks the appeal of a firm standing house, and they subsequently managed to open this brick—and stone—possessed market for the material wood. Among other building types, C&U started in 1907 the production of *Nordische Blockhäuser* of the log building type, which were inspired by both regional and Scandinavian traditions.

The new wooden log houses were presented in optimistic catalogues. They were built with beams and elements made on the basis of new high-precision fabrication methods. They were convincing in firmness, in the low material quantity needed and in low costs (fix prices). Because of the thin walls of only 7 cm logs plus interior cladding, they took about 20% less surface than a conventional house in brickwork.

The structural success of the logs rooted in a very sophisticated profile within dimensions of 7 cm thickness and 16 cm height. The logs were connected both by an exact fitting groove and wooden dowels. The edges of the logs were snubbed, what helped to concentrate the loads in the central part of the walls (avoiding splitting of the wood). The contact of the wall with the foundation—generally perfectly executed in brick, and often with a granite cladding—was established by a somewhat wider and thicker wooden element with an inclined top in the exterior part. For structural reasons, the corners were made with logs which continue over the corner point. The C&U firm concentrated all its know-how in the development of the details to find the right and structural sufficient dimensions, which were remarkably slender.
After an experience of soon 100 years the fire-authorities in Niesky are optimistic about these houses, since they hardly burn. Houses dating from the twenties or thirties which still stand, are generally sound. The rough wood was dried in open air and after this in hot-air halls in order to get a controlled low moisture level for the elements. Wood rot could be avoided both by structural details and with a low use of chemicals. Rain water was kept from the (air-ventilated) facade by lifting the entrance level some 70 cm or even more, and by using cantilevered roofs. Heating systems were chosen traditional which meant preferably no central heating and heating sources in only a reduced part of the house. Enough fire protection was established by keeping some distance between the individual house blocks — mostly semi-attached dwellings — which was in line with a garden city lay out of most settlements for C&U buildings.

From the viewpoint of building physics many houses turn out to be almost sufficient (according to recent norms). Especially the use of the log building principle, with 7 cm thick massive walls of horizontal wooden beams, finished inside with planks, ensured a reasonable heat insulation, also in terms of acoustical insulation.

Recent modernization, which tries to «improve» the heat-insulation and acoustical properties often show bad results, since the houses stay what they are: «wooden houses»: introduction of plastic window frames in connection with central heating generates moisture problems. An extreme renovation example is a house in Niesky, which has a new cladding outside in brick (Hilger 1997, Hilger 1999). For half-timbered houses, in some aspects comparable to the log building type, quantified renovation solutions for heat-insulation exist (Lamers 2000).

From an esthetical point of view, the C&U houses of around 1920 gained compared to earlier examples and they show a natural timeless beauty. To my opinion this roots both in the professional marketing of C&U and in the fact that the intelligent design was structurally adapted to the material wood. Other wood building systems, like Bauart Höntsch, a firm which also had representations in numerous German and European cities, tried to copy stone houses of any style, hardly concealing the barrack system details, resulting in a product with less charm, to my opinion (Glaussnitzer 1924, Junghans 1994).

**C&U LOG BUILDING 2ND PHASE: (JUGENDSTIL) HOUSES DESIGNED BY ALBINMÜLLER, 1914 APPROX. 1930** (Albinmüller 1921, Hilger 1997, Tomlow 2000a).

In the second phase, the firm, in a quite comfortable position because of its presence on the housing market, was eager to find cooperation with academic architects. Especially functionalist architects were also interested to work within the new industrial methods, as one knows from the building history of the experimental *Weissenhof Siedlung* in Stuttgart, 1927 (Tömlow 1998). Prof. Albinmüller (artist’ name of Albin Müller) from the *Künstlerkolonie* in Darmstadt, was one of the prominent figures. Albinmüller started
Figure 8
Drawing of Christoph & Unmack log building system.
(Wachsmann 1930)

Figure 9
Albinmüller, Design for a forest house with cantilevering upper floor on three sides (Albinmüller 1921)

Figure 10
Albinmüller, bachelors’ boarding house in the Pfittstrasse, Niesky, 1923 (Jos Tomlow)

Figure 11
Albinmüller, corner of bachelors’ boarding house in the Pfittstrasse, Niesky, 1923. Note the careful detailing of the cantilevering, making use of the floor beams rhythm. The beam tops on the left side are structurally honest, whereas the ones on the right are short beams, suggesting symmetry (Jos Tomlow)
with designs for C&U houses in a romantic colorful *Jugendstil*. These designs, part of them in color reproduction, were published in Albinmüller’s *«Holzhäuser»* of 1921, financed by C&U. This publication is an important step from the commercial C&U catalogues, towards the mature architectural theory in Wachsmann’s *«Holzhausbau»* of 1930.

Albinmüller builds in this first period many houses, contributing original decorations, vaguely reminiscent of cubism. He introduced functional ideas like cantilevering wardrobes in the second floor facade of a bachelors’ boarding house (1923, Plittstrasse 4, Niesky). In this boarding house, one can still find most of the original interior surfaces and one can look at stucco-imitating ceilings of a “rich” design of which Albinmüller was especially fond of (Hilger 1997). Technically the cassettes in these ceilings consist of wooden frame profiles, holding flat boards in between. In later times Albinmüller will build decent modern architecture in the C&U-systems, unfortunately loosing somewhat the material appeal of wood, for instance a restaurant for a theater exhibition in Magdeburg (Wachsmann 1930, 111).

**C&U LOG BUILDING 3RD PHASE: (MODERN) HOUSES DESIGNED BY KONRAD WACHSMANN, 1925–1929**

(Grüning 1986, Hilger 1997, Tomlow 2000a, Wachsmann 1930)


Historically highly relevant is that he illustrates the chapter on modern log building system with numerous photographs of the «director’s house» building process (Wachsmann 1930, 31–37). A technical problem of the log building type, is the high tendency of shrinking of the wood in the direction perpendicular to the trunk axis. This tendency of shrinking is many times as much as parallel to the trunk axis, and Wachsmann calculates the shrinking of log walls with up to 10 cm per 3 m. Although this problem was already dealt with in earlier C&U houses (and even in the traditional Umgebindehaus), I will discuss it in connection with the presentation of Wachsmann’s work for C&U. The solution that the C&U firm found, was to permit the story heights to shrink in a naturally way (i.e. from 300 cm to 290 cm). For this, of course, one had to prepare a perfect detailing with sliding parts over windows, door’s and paneled walls and even with sleeves for vertical technical pipes.

Along the small facades the girders of the top floor structure protrude somewhat from the exterior surface, which again is due to structural soundness, avoiding concentrated loads on vulnerable end parts. Small metal caps avoid rain water introduction.

An important decision of the C&U firm —and proof of its far-reaching view— was to require the German patent of the Swiss product «Lignat». Lignat was a normally 6 mm thick board of rather big plate dimensions. Lignat consists of a material mixture
Figure 13
Page 133 of Wachsmann’s Book showing the «director’s house» in Niesky, 1929 (Wachsmann 1930)

(asbestos, shredded paper, cement, chemicals) and the boards were used as a cladding of the interior walls and ceilings. The material was very popular since it did not burn and it was not affected by moisture (Tomlow 1998).

Nowadays the fabrication of such fibrous cement is considered unhealthy.

A question mark may be given concerning the modernity of the «director’s house», because its pitched roof is quite high, and some will think of
conservative architecture of the thirties. Wachsmann himself accounts that he needed the roof’s weight in order to keep the joints between the logs pressed together. On the other hand the four facades show a modern appeal, considering the year 1929, with a free and functional window distribution in an abstract geometrical lay-out. Remarkably are also the generous exterior stairs to front door and garden terrace (slightly different from the published plan). In the interior hall the landing of the stair and first floor balcony is consciously interrupted by the whitewashed volume of the chimney, which is thus free standing in order to enhance fire-protection.

The hall windows are concentrated in a 6 m long and 2 m high window series along the top end of the stair. These windows are beautiful from both inside and outside, but they are also the source of a structural defect in this house, similar existent in few other C&U houses. Because the exterior log wall of the hall is not stabilized by perpendicular walls over a length of some 7 m and, since the stair along this wall disconnects the floor structure from the wall, the wall tends to buckle. Because the material wood is «forgiving» such distortions of the wall surface are not fatal for the wall. Another reason for this kind of defeats is the behavior of wood to subsequently change form during long term loading.

Konrad Wachsmann’s position in the C&U firm is not very clear from a historical point of view (Grüning 1986). On the one hand he builds the — for advertisement reasons very important— «director’s house» and he publishes an important book with, again, a decent advertisement effect for the Christoph & Unmack firm. On the other hand, in the conventional C&U catalogue of 1928 his name or work does not appear. Maybe, one can ask, Wachsmann was too much of an individualist and too much a revolutionary constructor to keep in (slow) pace with the conventional thinking of the C&U firm? Sure is that he contributed modernity to the already existent honesty in structural design and freshness of the wooden architecture of C&U.

In 1930 Wachsmann opened an own office in Berlin, representing still the C&U firm. Konrad Wachsmann’s influence on the products of the C&U firm is smaller than thought by scholars. However,
without doubt Wachsmann’s theoretical work — f.i. the publication of his book *Holzhausbau-Technik und Gestaltung* (Berlin 1930) — modernized the somewhat traditional, yet generally respected image of the firm. As an important contribution to the Modern Movement architecture may be regarded his own executed projects, f.i. the «director’s house» (1929) for a chief engineer of C&U in Niesky, which is a log building. Other wooden buildings designed by Wachsmann for C&U, but not of the log building type, are: the famous Albert Einstein House in Caputh near Berlin (1928), a youth hostel in the Riesengebirge (competition entry), a Kinder-Walderholungsheim in Spremberg (child’s leisure center), a tennis club in Berlin, and the geological institute in Ratibor (Grüning 1986, Katalog 2001, Wachsmann 1930).

During the thirties live and work in Germany became impossible for the Jew Wachsmann and he managed to reach the USA. In a fruitful cooperation with Walter Gropius a modernized version of industrialized wooden building can be developed: the General Panel System. Inspired by more research work as a teacher in the «New Bauhaus», the Institute of Design and the ITT in Chicago, he will become one of the world’s most respected teachers of industrialized building and design. His publication: *Wendepunkt im Bauen* from 1959 is one of the key works on architectural design of the period (Wachsmann 1959).

One of the aims of this paper on Wachsmann’s work for the Christopher & Unnack firm, is to save the existing houses, not only from natural decay — which seems the smaller problem — but also from misunderstanding by the present generation.

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**REFERENCE LIST**


Industrialized log building by the Christoph & Unmack Company in Saxony


Nordische Blockhäuser 1928, Christoph & Unmack a. G. Niesky, Oberlausitz, Niederschlesien, Katalog XVI, Magdeburg: Buchdruckerei A. Wohlfeld.


