

A Proposition for the Typological Classification of European Farm Wagons

WRITING ON THE MAPPING of European carts and wagons Alexander Fenton (*Ethnologia Europaea* IX, 1, 1976) is unquestionably right in stating that at the present time "a consistent body of comparative data does not exist". These "comparative data" cannot be gathered without a soundly based typological analysis. The latter not existing, there can be no successful ethnological mapping. As for wheeled vehicles, it should be comparatively easy to map the main cart and wagon areas in Europe. Substantial preliminary work has already been done in this direction. Also, there should be no serious difficulties with the typification of carts. The situation is much more complex with the four-wheeled wagon.

Notwithstanding a number of studies from different parts of Europe, there is no coherent information in this field and the basic elements of wagon typology remain obscure. The questionnaire suggested by A. Fenton is undoubtedly based on sound principles, but concerning the wagons it is too vague and indefinite and we are to take into account the possibility that the information gathered with these questions does not allow us to distinguish the different types of wagons. Especially disturbing is the fact that no clear line is drawn between carts and wagons. True, A. Fenton has rightfully laid emphasis on some important common features in the construction of the cart and the wagon, but there exists a fundamental difference that cannot be ignored. This is the question of turning.

While turning is easy with the cart, with the four-wheeled wagon the facilitation of turning is one of the main problems. The different solutions of this problem might contribute to finding out the different types of wagons with their areas of distribution. We can say that in the construction of a wagon the key question is the method of connecting the front and the back wheels, and the way of turning the front wheels resulting from that. We might call all this together the *basic construction* of the wagon. Here various solutions of different territorial and temporal distribution offer good possibilities for featuring the typology and cultural historical relationships. Closely connected with the basic construction are the nature of the body and the elements of draught.

As a matter of fact, ethnologists have already in an early stage of research been aware that the basic construction should be the basis for the typology of the wagon (cf. Moszyński 1967 [= 1929]: 653—656; Berg 1935: 158—165), but the lack of sufficient data has hindered them from drawing distinct lines between different types on this basis. Up to now even some monographic studies have paid so little attention to the basic construction of the wagon that it is difficult to get a more detailed survey of it (e.g. Jenkins 1961). In most cases the basic construction has not been fully understood by the investigator because of the well-developed body, the character of which in its turn greatly depends on the basic construction. Sometimes the basic construction may have drawn no special attention, because in smaller regions that have been studied it reveals, contrary to the body, no differences worth mentioning.

In A. Fenton's questionnaire the basic construction of the wagon is touched upon in points 4—6 (4. The presence or absence of a central main-beam; 5. The form of the central main-beam; including, for wagons, the method of linking the front and rear elements; 6. The presence of side-beams). Unfortunately these questions are on the whole connected both with the wagon and the cart while the utterly important problem of turning the wagon has not been developed at all. We may only assume that it is latent in the point "the method of linking the front and rear elements". It is most likely that without definite illustrative examples the data assembled with this questionnaire remain incomparable.

The Soviet Baltic republics have been a fruitful region of research for the author of the present paper, as here several different variants of the basic construction make up more or less distinct areas of distribution. These areas are obviously connected with further hinterlands in East and Central Europe and Scandinavia. Therefore it is highly possible that the typology based on the material of the Baltic countries can be applicable to the European farm wagons on the whole.

TAKING INTO ACCOUNT THESE CONSIDERATIONS the following proposition for the typological classification of farm wagons by their basic construction has been worked out, primarily on the ground of the Baltic material.

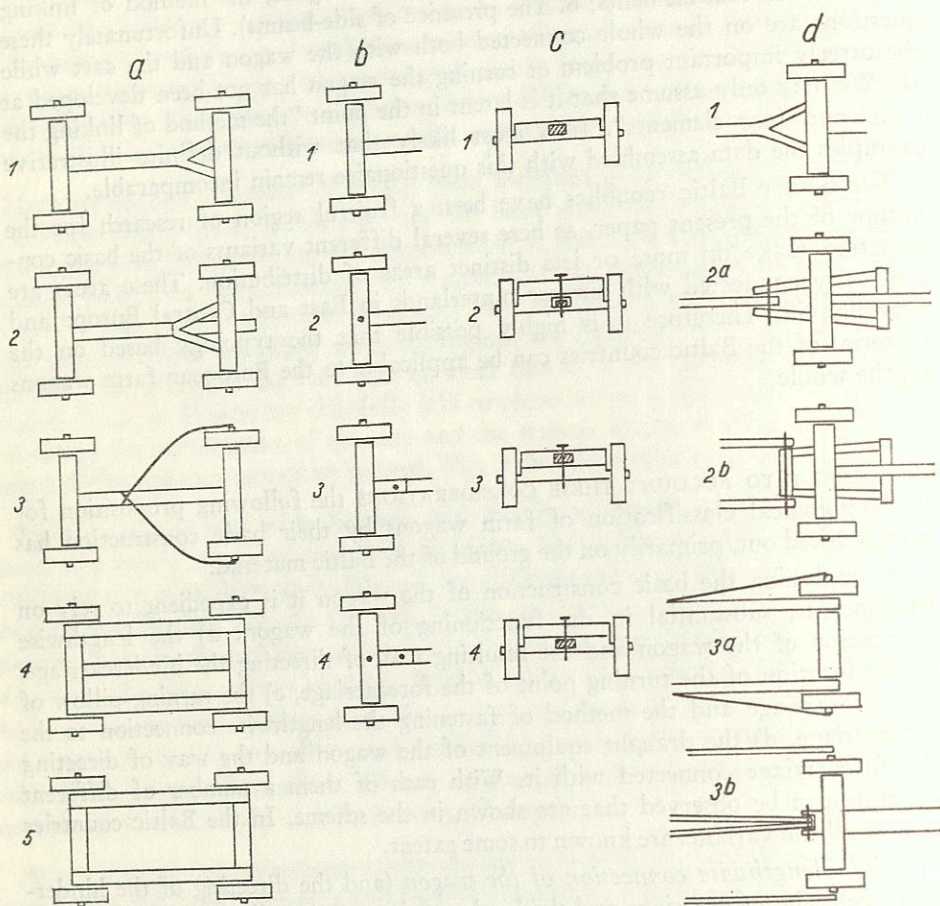
In analyzing the basic construction of the wagon it is expedient to rely on four points, substantial in the functioning of the wagon: a) the lengthwise connection of the wagon and the resulting way of directing the hindercarriage, b) the location of the turning point of the forecarriage, c) the turning-pillow of the forecarriage and the method of fastening the lengthwise connection to the forecarriage, d) the draught equipment of the wagon and the way of directing the forecarriage connected with it. With each of them a number of different variants can be observed that are shown in the scheme. In the Baltic countries almost all the variants are known to some extent.

a) *The lengthwise connection of the wagon* (and the directing of the hindercarriage). The forecarriage and the hindercarriage are usually linked together by a central main-beam (German *Langbaum*, Russian *lisica*) (Fig. 1: a1—4). Probably the oldest variant of the main-beam is the *forked main-beam* (a1), already seen in the Scandinavian Bronze Age rock carvings. In the 19th—20th centuries it was widely spread especially in East and North Europe. The fork is fastened into the rear axle-tree and this guarantees a stable steering of the hindercarriage.

The next step in the evolution is possibly the straight, *unforked main-beam*. In this case there are a number of ways to direct the hindercarriage. Mostly, especially in Central and West Europe, a separate *hinderfork* (a 2) is used. It is fastened to the main-beam in the centre. The hinderfork may have different constructions (a natural fork, two separate trees crossed on the main-beam or fastened to its sides, etc.). This in its turn helps us to distinguish different

Fig. 1

The schemes of the basic construction of the wagon



territorial modifications of wagons (Berg 1975: 159—160). The wagon with a separate hinderfork can be lengthened or shortened by the main-beam, when necessary. The main-beam itself is not fastened to the hindercarriage but is loosely thrust through an opening in the rear axle-tree. The hindercarriage is fixed to the forecarriage by an upright pin fastened into the main-beam in two ways. The pin may attach the first end of the hinderfork to the main-beam, or it may be fastened into the main-beam behind the rear axle. In both cases there may be several holes in the main-beam to change the length of the wagon. These wagons with adjustable length usually have loose, unfixed bodies, easy to change.

A second means of directing the hindercarriage on wagons having unforked main-beam, the *hinderguides* (a3), is known mainly in East Europe. They run from the ends of the rear axle to the centre of the wagon where they are fastened to the main-beam or to the body. A third way is an additional linking of the hindercarriage and forecarriage by two *side-beams* (a4) that are fastened to the turning-pillow of the forecarriage and form at the same time the bars supporting the body. If the side-beams are fastened firmly enough, the central main-beam may be missing altogether (a5). It is the latest development in connecting the forecarriage and hindercarriage (in case we regard the wagon with the central main-beam as the primary type of European farm wagons). The length of the wagons with side-beams is not adjustable, but their advantage lies in the possibility to construct firm bodies of various shapes. Variants a4 and a5 are characteristic especially of Russian farm wagons. Variant a3 is the only one that is not found among common farm wagons of the Baltic countries.

b) *The turning point of the forecarriage.* In European prehistoric wagons the turning point was missing (b1), but in recent ethnological material it is rarely absent; for example, it can be seen in small hand-carriages or in children's toys.

In European farm wagons the turning point is usually on the pivoted front axle (b2). For turning the forecarriage this is the best place and allows the construction of wagons with a good maneuverability. In such wagons there is a movable *turning-pillow* (German *Drehschemel*, Russian *poduška*) on the front axle. It is fastened in the centre to the axle-tree by a vertical bolt, the *king pin* (German *Spannagel*, Russian *švoren*, *serdečnik*). The front end of the body is fastened on the turning-pillow and holds the latter more or less parallel to the rear axle while under the pillow the front axle turns round the king pin. This kind of construction has its drawbacks: in turning, the king pin bears great pressures and may easily break. The pressures from different directions can be lessened by additional props fastened to the front axle. In turning they support the main-beam. The king pin itself must be very firm, especially in a wagon without additional props. Therefore it was one of the first iron elements of the wagon. Generally the turning point on the front axle became more common with the transition to wagons with iron details, as has been demonstrated in the Baltic countries (especially in Estonia).

It is possible to reduce the pressure on the king pin by taking the turning point backwards a bit behind the front axle. This is made possible by a *pivoted main-beam*, i. e. the main-beam is divided in two near the front axle, while both parts are fastened to each other by the king pin (b3). Thus the turning point is on the joint of the main-beam. With a firm body such a wagon has quite limited turnability, therefore the wagons with a pivoted main-beam have bodies with loose side-racks. Wagons with the turning point on the joint are known only in southern Scandinavia and Estonia.

More widespread are wagons with a *double turning point*. The king pin is both on the front axle and on the joint (b4). In this case there is also a turning-pillow on the front axle. Such wagons, in which we can see an outcome of the crossing

between varieties b2 and b3, are especially easy to operate, but need solid king pins (of iron) and a loose rack-body. Wagons with double turning point can be found in German and Dutch regions and are quite common also in South Scandinavia, West Lithuania, Kurzeme and (more recently) in Estonia.

c) *The turning-pillow* (and the method of fastening the main-beam to the forecarriage). Wagons without a turning point on the front axle have no turning-pillow. Such are the old Swedish-Estonian wagons with a pivoted main-beam. Here the front part of the main-beam is firmly mortised in the axle-tree (c1). Wagons with a turning point on the front axle have always a turning-pillow, while the main-beam may be fastened in two separate ways. The first of these is close in principle to the wagons with a pivoted main-beam: here the main-beam is also fastened to the axle-tree, but can turn round the king pin that goes through its front end (c2). To facilitate the turning there is a wider opening in the axle-tree which allows the end of the main-beam to turn to the right or to the left. The second way is to mortise the main-beam firmly into the turning-pillow (c3). Variant c2 requires a very solid king pin (of iron) and is characteristic of Central and West Europe, c3 is spread in East Europe where the main-beam can be replaced by side-beams that are fastened to the turning-pillow. In wagons with double turning point the first part of the beam is always fastened to the axle-tree. The joint may be mortised (c4) or movable (c2).

d) *The draught equipment and the directing of the forcecarriage*. The directing of the forecarriage is closely connected with the draught elements that are fastened to the front axle. Like the hindercarriage, the forecarriage also needs at least two fastening points linked with each other, which guarantees its firm directing. Here the oldest form is analogous to the ancient way of directing the hindercarriage: corresponding to the forked main-beam is a *forked pole*, i. e. a forked-end draught pole with its ends mortised into the front axle-tree (d1). Like the forked main-beam, the forked pole is seen already in Scandinavian rock carvings. Accordingly it has been supposed that the four-wheeled wagon may have evolved from two carts joined together by a forked pole (Berg 1935: 162—163). But while in the cart the pole or shafts fixed to the axle are quite appropriate, in the wagon with a pole there appears a real shortcoming: the draught becomes more difficult because the pole stands too low and its draught angle cannot be changed. Therefore, to make the draught more effective, it is expedient to attach the pole or the shafts to the front axle so that they can move up and down. This results in one more advantage: on rough roads the jolts do not directly carry from the vehicle to the draught animal(s).

This kind of joining is made possible by the *front fork*, separate from the pole. Between its front ends the back end of the pole is fastened with a level peg, around which it can turn up and down. This development is analogical to the formation of the hinderfork though the functional aims have been different in each case. The rear part of the front fork extends behind the front axle. There the rear ends of the fork are joined to each other by a bar, on which the main-

Fig. 2

The distribution of wagon types in the Baltic countries and Finland at the beginning of the 20th century. The fat line marks the eastern border of the general occurrence of types B, C and D; the broken line marks the northern border of type C.

beam rests in turning. Thus the front fork is one of the earliest means of making the wagon with a turning-pillow more stable and keeping the king pin from breaking. It is especially characteristic of Central and West European double-harness wagons. The means of draught on these horse-wagons are usually traces and swingletrees and the pole has, as a rule, become a *guide pole*, i. e. it is not a draught element any more and its task is to direct or brake the vehicle. In single harness the shaft(s) have the same function as in trace-swingletree draught. In the above-mentioned region the front fork is in use on one-horse wagons as well. Then the first ends of the fork are placed more apart and are joined by a bar, like the back ends. So the fork actually becomes trapezoid or almost rectangular in shape. The shafts are movably fastened to its front end (d2b). Such application of the front fork seemingly points to the fact that in West Europe the single-harness wagon with shafts is more recent than the wagon with a pole.

On the East European single-harness wagon each shaft is separately fastened to the front axle, and the forecarriage can be directed with the help of the *guides* (Russian *tjaži*), i. e. ropes, wooden or iron rods that run from both ends of the axle to the shafts (d3a). The rear guides for directing the hindercarriage (a3) have seemingly been introduced after the front guides. On the old Scandinavian two-horse wagon with two pairs of shafts the forecarriage is directed principally in the same way (Hagar 1973: 199, fig. 2 A—D). Here the inner shafts are fixed in the centre of the axle-tree to the projecting front end of the main-beam, and the outer shafts to the external ends of the axle (d3b). Such two-horse wagons were known in the Baltic countries only in the south-western part of the island Saaremaa in Estonia (Viires 1972: 259—260).

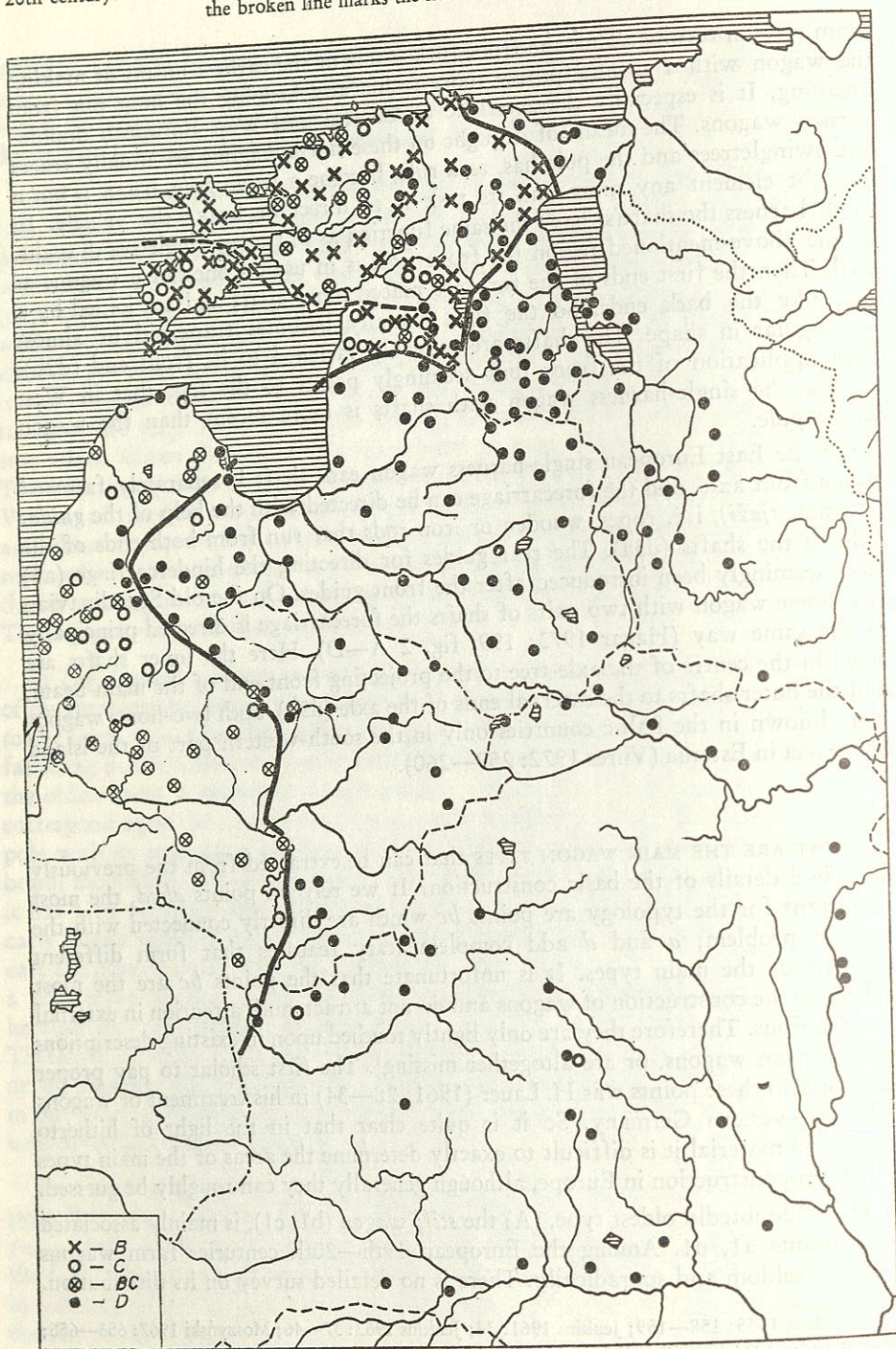
WHAT ARE THE MAIN WAGON TYPES that can be extracted from the previously described details of the basic construction? If we rely on points *abcd*, the most important for the typology are points *bc* which are directly connected with the turning problem; *a* and *d* add complementary features that form different variants of the main types. It is unfortunate that the points *bc* are the most hidden in the construction of wagons and do not attract much attention in external examinations. Therefore they are only lightly touched upon in existing descriptions of European wagons, or are altogether missing¹. The first scholar to pay proper attention to these points was H. Lauer (1961: 28—34) in his treatment of wagons in north-western Germany. So it is quite clear that in the light of hitherto assembled material it is difficult to exactly determine the areas of the main types of wagon-construction in Europe, although generally they can roughly be guessed.

The undoubtedly oldest type, (A) the *stiff wagon* (b1. c1), is mainly associated with points a1, d1. Among the European 19th—20th centuries farm wagons it is met seldom and sporadically. There is no detailed survey on its distribution.

1. cf. Berg 1935: 158—159; Jenkins 1961: 34; Jenkins 1962: 37—46; Moszyński 1967: 653—656; Zelenin 1927: 138; Volkov 1916: 300; etc.

Fig. 2

The distribution of wagon-types in the Baltic countries and Byelorussia at the beginning of the 20th century. The fat line marks the eastern border of the general occurrence of types B, C and BC, the broken line marks the northern border of type C.



The existing incomplete information is in many instances poorly documented (cf. Berg 1935: 158; Jenkins 1961: 5). Quite certain is the recent occurrence of the stiff wagon in Sweden (Berg 1935: 158), Poland (Czekanowski 1952: 114) and Dalmatia (Moszyński 1967: 653, fig. 518: 5). In the Baltic countries we have a few more or less reliable data from south-eastern Estonia about the use of this wagon at the end of the 19th century.

Thus the most common wagon in Europe in the 19th—20th centuries is the *turnable wagon* (B—D). One of its simpler forms is (B) the *wagon with a pivoted main-beam* (b3. c1). The main-beam can be forked (a1) or have a separate hinderfork (a2). As for the draught means, all three basic variants (d1, 2, 3) concur with this type. The *wagons with a turning-pillow* (b2. c2. 3) can be divided in two clearly different types: (C) the *wagon with axle-tree connection* (b2. c2) where the front end of the main-beam is fastened turnably in the axle-tree under the turning-pillow, and (D) the *wagon with turning-pillow connection* (b2. c3) where the lengthwise connection (the main-beam resp. the side-beams) is fixed in the turning-pillow. Part of type C as well as type B are the forked main-beam (a1) or the hinderfork (a2), out of the draught elements usually the forked pole or the shafts (d2). On type D the draught means usually are shafts and guides (d3), and all five variants of lengthwise connection can be found (a1—5), which shows the expediency of this type. In the original forms of type D the turning-pillow is inseparably linked with the hindercarriage. The separate hinderfork (a2) together with the adjustable length of the wagon seem to be a recent development, influenced by type C.

To the four above-named basic types a mixed type can be added. It is (BC) the *wagon with a pivoted main-beam and a turning-pillow* (b4. c2.4) that has risen from a crossing of type B and type C.

ALL THESE TYPES OF THE TURNABLE WAGON are extant among the traditional Baltic farm wagons. As mentioned above, they form distinct areas of distribution (see the map). The wagon with a pivoted main-beam (B) was common in most parts of Estonia, with the exception of eastern, especially south-eastern Estonia. Typically this is a one-horse wagon with shafts and guides (d3), but the ancient local ox-wagon with a pole (d2) seems to have had the same construction, proved by some recent specimen from Saaremaa. Besides Estonia the same type is known in South Sweden and on the Danish islands (Berg 1935: 159; Långström 1955: 17), usually in the form of a wagon with a front fork and shafts or a pole (d2). This local peripheral distribution in the European wagon-area indicates that type B can be regarded as a possible relic of an earlier and wider distribution.

The wagon with axle-tree connection (C) was spread in West Lithuania, Kurzeme, on Saaremaa and in a narrow region in south-western Estonia. More recently, beginning with the second half of the 19th century, it was used by the peasantry as a light carriage, to some extent also in other regions of the Baltic countries. As a farm wagon, type C in the Baltic countries is used alongside

with another type: in Estonia type B, in West Lithuania and Kurzeme the mixed type BC. The latter, i. e. the wagon with a pivoted main-beam and a turning-pillow, was in use as a two-horse wagon in the first place, while type C was usually a one-horse wagon. Type BC spread at the end of the 19th century also to the western part of Estonia (not shown on the map), but only as a one-horse wagon.

Type C is primarily a Central and West European wagon that has spread to the east, besides the Baltic countries, over Poland and Hungary to the Balkans and the Ukraine and further to the steppes of the lower Volga². The mixed type BC is typical of the northern part of Germany, Holland, South Scandinavia and Great Poland³.

The largest area in the Baltic countries is the one of the wagon with turning-pillow connection (D). It occupies the whole of East Lithuania, most of Latvia, and South East and East Estonia. Replacing type B, its variant with a separate hinderfork (a2) spread in the second half of the 19th century all over eastern Estonia and later in all Estonia as a product of modern wagon-industry. Type D is general in Byelorussia, in the wagon-area of the Pskov province (the northern part of the province belongs to the original cart-area) and further in the eastern regions of Russia⁴. Everywhere this is a one-horse wagon with shafts and guides (d3a), from which several variants have developed.

We shall not dwell on the problems of origin, development and diffusion of different wagon-types in the Baltic countries. It will suffice to note that we are dealing with separate layers that thoroughly differ in their chronology and origin. The oldest ones are types B and D while types C and BC are more recent; the latter spread from Central Europe probably with the medieval German expansion to the east, which seems to be clear from the abundant German terminology associated with them. The interaction of different types has led to mixed forms, especially with regard to the body. As a result, regional wagons of a specific character appeared: in Estonia a small one-horse wagon with side-racks, in Latvia and East Lithuania a small wagon with side-boards, in West Lithuania and Kurzeme a large two-horse wagon with a rack-body, in Latvia in Vidzeme and Latgale, more recently, a flat-bodied trolley. This external originality is always connected with differences in the basic construction. Therefore there can hardly be any doubt that it is ethnologically relevant first to map the basic wagon-types because trying to account for all local varieties would render the picture in Europe unnecessarily multifarious.

2. Balkenholl 1929: 62, 78 — Germany; Lauer 1961: 3, 34 — Siegerland, Hessen; Oudemans 1926: 56, 105, 110 — Holland; Legros 1960: 93—114 — Belgium; Långström 1955: 17 — Danish mainland; Scheuermeier 1956: 149, 152 — North and Central Italy; Paládi-Kovács 1973: 33, and Fél, Hofer 1974: 55, fig. 21 — Hungary; Marinov 1973: 372—373 — Bulgaria; Beškovič 1959: 215—216 — the Ukraine and South Russia.

3. Lauer 1961: 30—35 — north-western Federal Germany; Oudemans 1926: 21—22, 55—56 — Holland, Hannover, East Prussia; Berg 1935: Pl. XXVIII: 3, Erixon 1935: fig. 73, Långström 1955: 17 — Sweden; Burszta 1964: 676—678 — Great Poland.

4. Beškovič 1959: 211—213 — Russians; Preobraženski 1854: 154 — the Tver gubernia; Nikiforovski 1895: 364 — the Vitebsk gub.; Busygin, Zorin 1960: 103 — the Čuvaš ASSR; Petzholdt 1851: 108—110, Fig. 27 — the Tambov gub.

Fig. 3:

An ox-wagon with a pivoted main-beam (B) from Saaremaa (Kihelkonna), Estonia. See the forked main-beam (a 1), the front fork (d 2 a) and the rungs in the pillows.
Photo taken by the author in 1966.

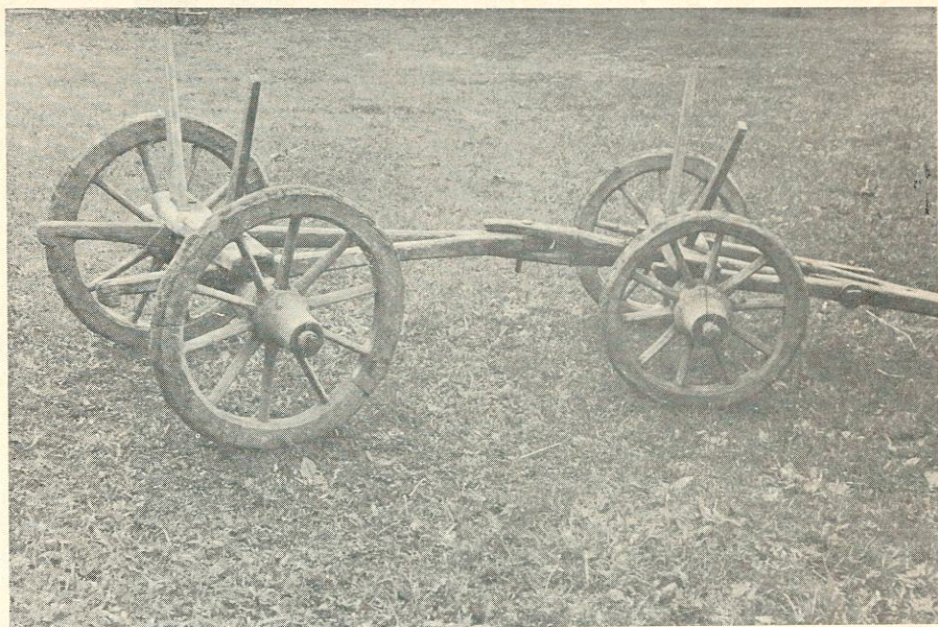


Fig. 4:

A wagon with axle-tree connection (C) from Saaremaa (Mustjala), Estonia. See the forked main-beam (a 1), the shafts with the guides (d 3 a), the turning-pillow and the king pin, the rungs.
Photo taken by the author, 1966.

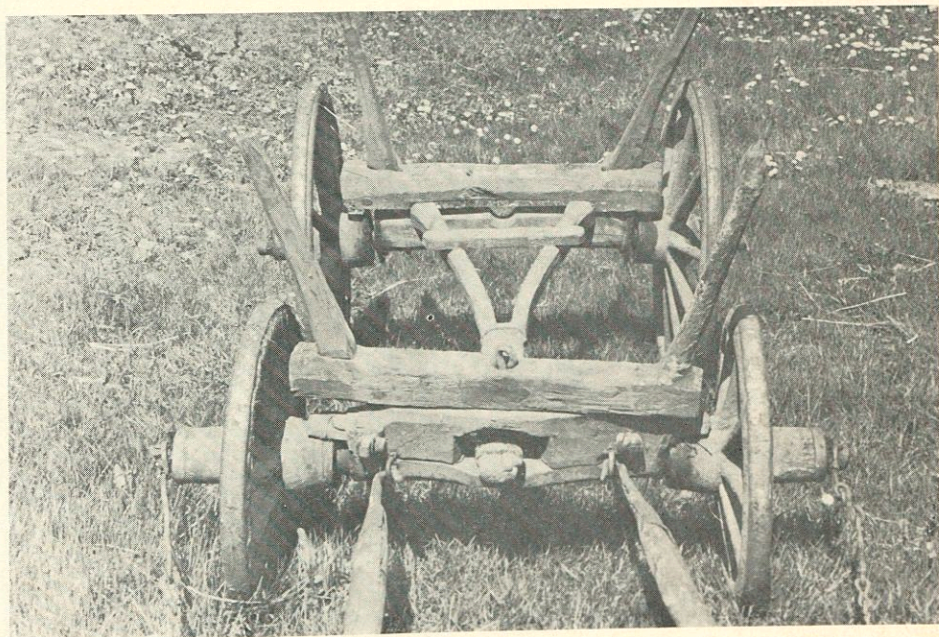


Fig. 5:

A wagon with axle-tree connection (C) from Kurzeme (distr. Talsi), Latvia. See the hinderfork (a 2), the turning-pillow on the front axle and the rungs. The length is adjustable.
Photo by the author, 1965.

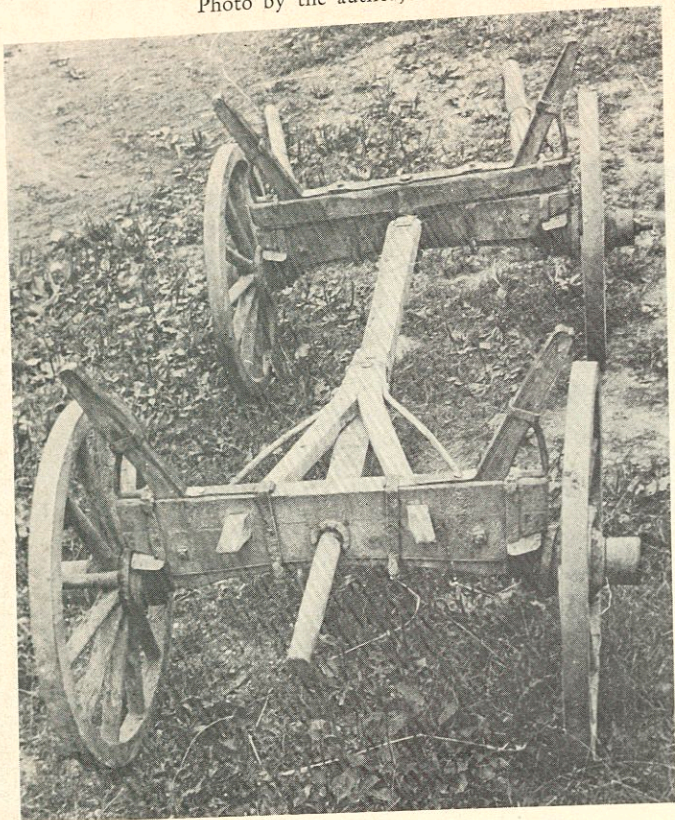
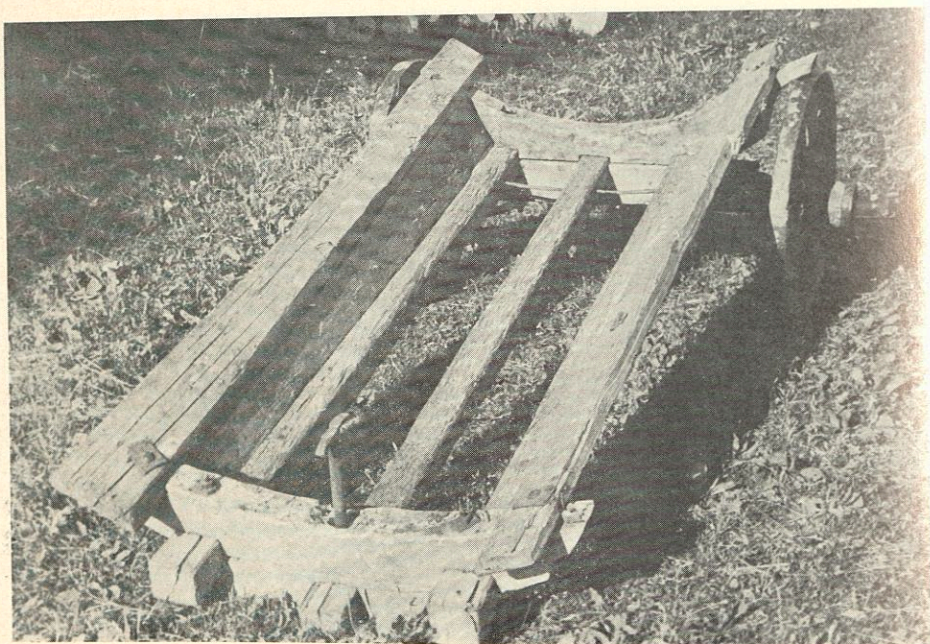


Fig. 6:

The hindercarriage of a wagon with turning-pillow connection (D) together with the turning-pillow on the king pin. See the unforked main-beam and two side-beams (a 4). Latgale (distr. Preiļi), Latvia. Photo by the author, 1970.



To get sufficient information about the distribution of the basic types, the questionnaire should include at least three following points concerning the basic construction of the wagon:

1. The presence or absence of the turning-pillow.
2. The form of the main-beam: with or without a joint; forked or not.
3. The method of fastening the main-beam to the forecarriage: to the axle-tree (mortised or turning round the king pin), or to the turning-pillow (here the main-beam may be replaced by two side-beams).

IT IS OBVIOUS THAT MORE QUESTIONS are needed to get essential information for dividing the types into variants. Here belong the methods of directing the hindcarriage (a), the draught equipment and the methods of directing the forecarriage (d), in connection with which we must not forget the draught animals (oxen, horses) and their number. For example, many innovations and changes in the construction of the wagon have taken place because of the transition from ox draught to horse draught. As for the guiding of the hindcarriage, the essential question arises, whether the length of the wagon is adjustable (as in the case of wagons that have the hinderfork) or not, because the form of the bode largely depends on this.

As for the bodies, they vary very much in connection with the transport requirements, therefore it would be a too difficult task to map them. Inevitably we must confine ourselves to a few essential features which can safely be found out on the basis of the questionnaire suggested by A. Fenton (p. 10). The spread of the rungs is certainly of special interest, as their presence or absence to a great extent determines the character of the body. It must be agreed that the stake-brace as an easily observable detail also deserves attention. However, with regard to the body it would be quite expedient to add a question of a more general character: whether the body is usually universal and somewhat adjustable for different purposes (e. g. a framework added in hay harvest) or whether there are different bodies for different purposes. Here clear regional and temporal differences seem to exist.

The stake-brace presents a good example for demonstrating the importance of the terminological data (cf. Fenton 1976: 7). In this connection attention should be paid first of all to the names of the wagon and its main-beam, as the latter is an especially characteristic feature of the European wagon. For example, in the Baltic countries the names of the wagon fall clearly into two main groups: 1. Estonian *vanker*, Latvian dialect *vāgi*, connected in one or another way with Germanic equivalents (cf. German *Wagen*, Swedish *vagnen*); 2. the old regional name "wheels" (Lithuanian *ratai*, Latvian *rati*, Estonian *rattad*) that has direct semantic parallels in the neighbouring East Slavic areas (Old Russian *kola*, Byelorussian *kaljosa*, South Russian *kolesa*, etc.). It is quite evident that in these

names the same old relations with the Slavic and Germanic world are revealed, that are also extant in the different types of wagons.

The given examples should have made clear that the European farm wagons, like every cultural feature of some importance, are of real interest for the study of ethnic and historical relations. Therefore they have a definite place of their own in ethnological research. We can be quite sure that the mapping of wagons covering all of Europe would be a real help for further investigation. At the same time is obvious that in a work of such a wide range the investigated elements or features must be strictly selected, a point that has been firmly stressed by A. Fenton. The present paper was intended to offer some help in the selection of the elements that are necessary for a successful gathering of information.

REFERENCES

- BALKENHÖLL, J.
Deutsche Ackerwagen. Eine arbeitswissenschaftliche Studie. Göttingen 1929.
- BERG, G.
Sledges and Wheeled Vehicles (Nordiska Museets Handlingar: 4). Stockholm — Copenhagen 1935.
- BEŠKOVIČ, A. S., and others
Chozjajstvo i byt russkich krestjan. Pamjatniki material'noj kul'tury. Moskva 1959.
- BURSZTA, J.
Transport i komunikacja. In: *Kultura ludowa wielkopolski*. Tom drugi. Poznań 1964.
- BUSYGIN, J. P., ZORIN, N. V.
Russkoje naselenie Čuvašskoj ASSR. Material' naja kul'tura. Čeboksary 1960.
- CZEKANOWSKI, J.
Z dziejów wozu i zaprzęgu. In: *Lud*, t. XXXIX. Kraków — Poznań 1952.
- ERIXON, S.
Skultuna bruks historia. Del II. Bruksområdet och socknen II. Stockholm 1935.
- FÉL, E., HOFER, T.
Geräte der Átányer Bauern. Kopenhagen 1974.
- FENTON, A.
On the Mapping of Carts and Wagons in Europe. In: *Ethnologia Europaea*, vol. IX, 1, 1976.
- HAGAR, H.
Die Zugvorrichtungen bei den zweispännigen Ackerwagen für Pferde in Skandinavien und Finnland. In: *Land Transport in Europe* (ed. by A. Fenton, J. Podolák, H. Rasmussen). Copenhagen 1973.
- JENKINS, J. G.
The English Farm Wagon. Lingfield 1961.
- JENKINS, J. G.
Agricultural Transport in Wales. Cardiff 1962.
- LAUER, H.
Die Ackerfahrzeuge Nordwestdeutschlands. Diss. Frankfurt/Main 1961.
- LEGROS, É.
L'ancien charroi de Jalhay. In: *Enquêtes du Musée de la Vie Wallonne*, t. IX, Nos 97—100, 1960.

- LANGSTRÖM, T.
Svenska fordonstermer (Meijerbergs Arkiv för Svensk Ordforskning 10). Göteborg 1955.
- MARINOV, V.
Traditionelle Transportmittel in Bulgarien. In: *Land Transport in Europe* (ed. by A. Fenton, J. Podolák, H. Rasmussen). Copenhagen 1973.
- MOSZYŃSKI, K.
Kultura ludowa Słowian. Tom I, Kultura materialna, Wydanie drugie. Warszawa 1967.
- NIKIFOROVSKI, N. J.
Očerki prostonarodnogo žitja-bytja v Vitebskoj Belorussii i opisanie predmetov obichodnosti. Vitebsk 1895.
- OUDEMANS, T. C.
Die holländischen Ackerwagen. Eine arbeitswissenschaftliche Studie. Wageningen 1926.
- PALÁDI-KOVÁCS, A.
A magyar parasztság kerekcses járműveinek történeti és táji rendszerezéséhez. In: *Néprajzi közlemények* XVIII. Budapest 1973.
- PETZOLDT, A.
Beiträge zur Kenntnis des Inneren von Russland, zunächst in landwirtschaftlicher Hinsicht. Leipzig 1851.
- PREOBRAZHENSKI, V.
Opisanie Tverskoj gubernii v sel'sko-chozjajstvennom otnošenii. S.-Petersburg 1854.
- SCHEUERMEIER, P.
Bauernwerk in Italien, der italienischen und rätoromanischen Schweiz II. Bern 1956.
- VIRES, A.
Typen des Pferdeanspanns im Baltikum in ihrer räumlichen und zeitlichen Verbreitung. In: Festschrift Matthias Zender (hrsg. von E. Ennen, G. Wiegmann). Bonn 1972.
Russian Influence in East Baltic Wheeled Vehicles. In: *Ethnologia Slavica* 7, Bratislava 1977.
- VOLKOV, F.
Etnografičeskie osobennosti ukrainskogo naroda. In: *Ukrainskij narod v ego prošlom i nastojščem*. T. II. Petrograd 1916.
- ZELENIN, D.
Russische (Ostslavische) Volkskunde, Berlin u. Leipzig 1927.