MODELLING THE PROCESSES OF STRATIFICATION IN MEDIEVAL URBAN DEPOSITS

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ABSTRACT

Urban archaeology deals mainly with multilayer sites. On account of the age, thickness, ways and conditions of the layer's accumulation, urban deposits are characterised by excellent state of preservation of components, structure and accompanying features. Generally it was a rescue of the dynamics of accumulation, which, as a rule, testifies mainly short incoherent episodes regulated by ceaseless levellings. By reason of that, each of the investigated layers should be eliminated and determined. Beside of a precise description of components and physical features of the whole layers, the character and spread of their accumulation should be univocally specified. The set of such "defined" layers, drawn up in a stratigraphical sequence, determines the process of stratification of the site. Such a reconstruction is of a greatest value in a further, detailed analysis on dating and function of the exposed features.

One of the most important factors in the socio-economic history of early Medieval Europe was the significant proliferation of new urban centers. While modern research often concentrates on exposing the organisational, developmental and cultural differences between them, it is nevertheless true to say that, from an archaeological point of view, these new agglomerations shared a number of common features.

For one thing, they produced a tremendous amount of rubbish (Keene 1982:26-29). Owing to the townspeoples' lack of experience in collective living, their primitive technology and general ignorance, waste disposal represented a serious problem, which could not be solved by mere legislation. Waste material was produced in such quantities that it eventually began to fill up back-yards, to clog streets and passageways, and even to cover living-floors. Sooner or later it had to be disposed of, by either spreading or removal.

The other common feature that must be mentioned concerns the towns' susceptibility to destruction. Their dense settlement structure, coupled with the prevalence of timber buildings, made the risk of fire very great; under the right conditions, the whole town might well go up in flames. The histories of all Medieval European towns are full of such events, which were caused not only by invasions, local rebellions and arson, but very often by sheer carelessness. Despite this, they were nearly always rebuilt; sometimes almost immediately and in a well-organized fashion, sometimes slowly and irregularly, or in a series of steps.

Broadly speaking, the formation of the stratigraphy in Medieval towns is the result of the operation of uniform, dynamic depositional processes (Urbanczyk 1981:5-52). These processes, I would like to emphasize, were not so much a matter of continuous accumulation, but rather of incessant removal, which is also known as "levelling" In Medieval deposits, three main types of levelling activity can be recognised. The first type derived from daily activities, and can therefore be called "daily levelling"; it consisted mainly of spread waste material, and the layers created in this way usually belong to the group of so-called "occupation deposits". The second type can be termed "local levelling" and involves layers that were removed and deposited elsewhere for some specific purpose. In effect, such removals produce breaks in the stratigraphy. However, they rarely affect more than one phase, since they are usually associated with local rebuilding. The third and most important type comprises layers removed during large-scale

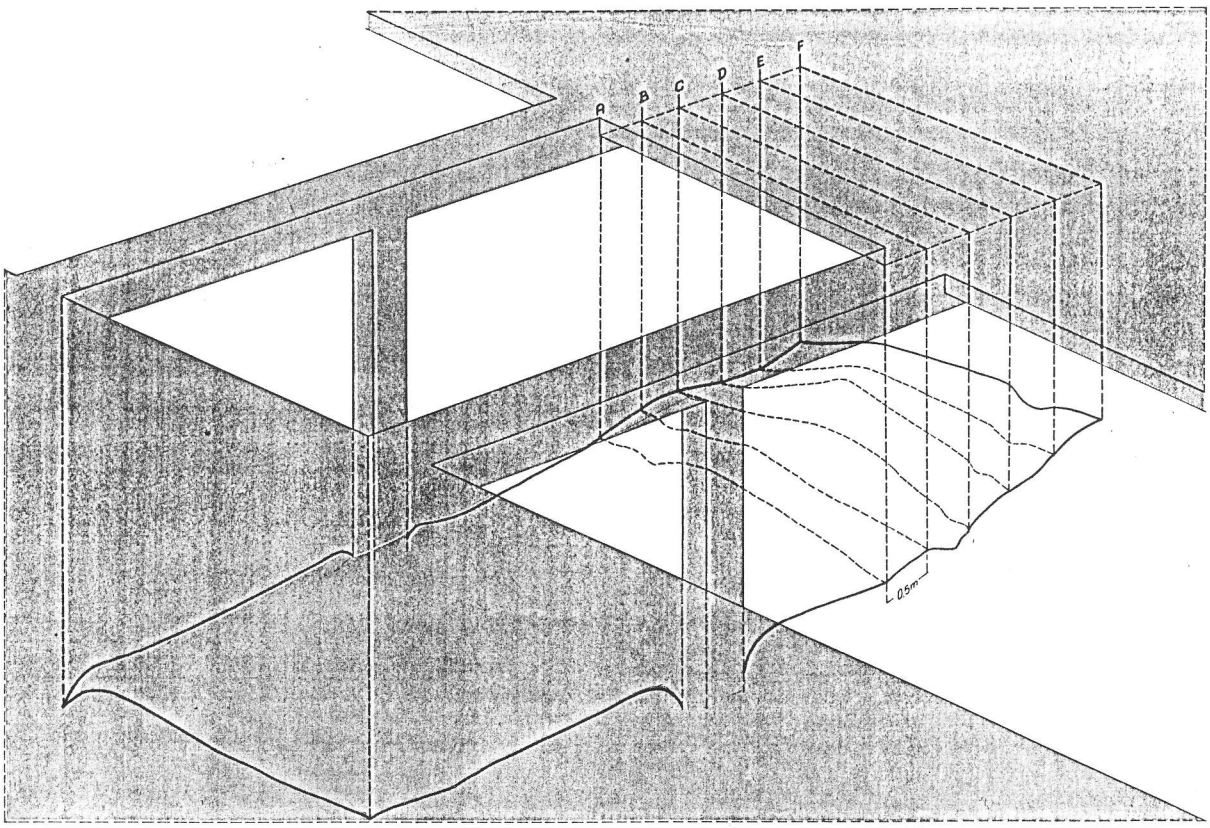

Fig 1. Finnegården 3A, Schematic block diagram of central site area showing succesive profile extensions.

levellings, which were often undertaken after major disasters and covered greater areas. This "structural levelling"allowed the inhabitants, perfectly legally,to get rid of the accumulated refuse. Removals of this kind often reached quite far down into the underlying deposits, so that redeposited layers belonging to older phases were sometimes redeposited for a second time.

The combination of fast accumulation and successive renewals means that urban archaeologists deal primarily with multi-level sites. The same factors also produced excellent conditions for the preservation of constructions, layers and artefacts. And, unlike the prehistorian, the Medieval archaeologist does have access to written records. All of these things may well have contributed to fostering the impression that, though the fieldwork can be technically difficult, the actual analysis of Medieval urban sites is relatively straightforward. I think I am right in saying that this view is held by some archaeologists as well as by most historians.

During the last 20 years there have been great improvements not only in post-excavation research but also in the actual methods of archaeological field-work. Changes in the approach to stratigraphical investigation have been especially important. The emphasis nowadays is placed more and more on precise identification of the successive layers in the excavated deposits, and this in turn leads to greater possibilities of relating the layers to each other, and of presenting the depositional sequence schematically and graphically (Harris 1979). Almost all archaeologists accept this method as obligatory, and it is a hopeful sign that the profession has finally recognised its main source of information (Golembnik 1987).

Various other refinements and requirements have emerged in recent years. For instance, it is now a tenet of archaeological field-work that excavations should be conducted so as to expose each distinct level of contemporaneous structures and layers. But there are some worrying trends: excavation areas have tended to get bigger, while the use of control profiles has decreased in many cases. With the number of layers on sites often extending into the thousands, the stratigraphical matrices used in archaeological analysis have begun to reach imprac-

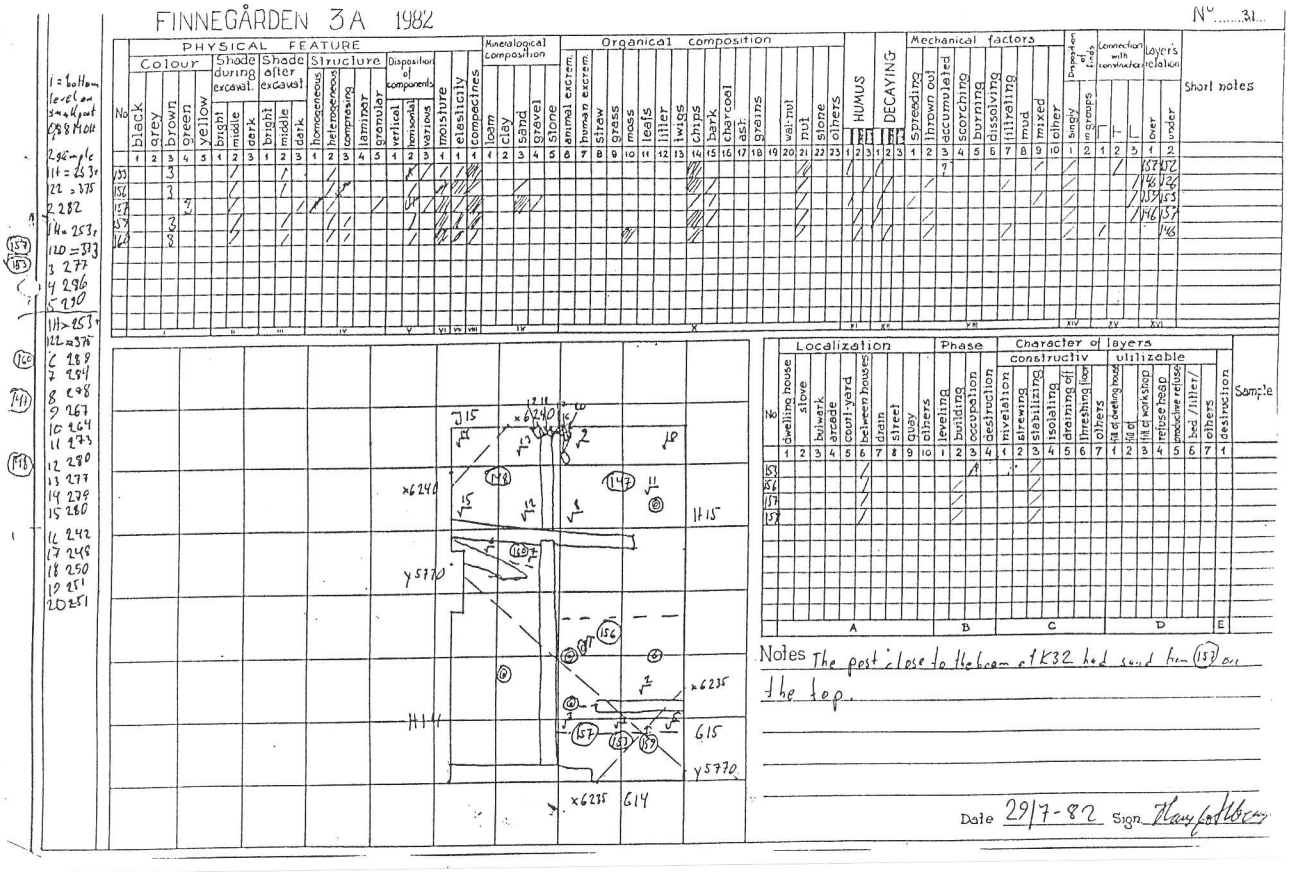

Fig 2. Finnegården 3A, The layer description form.

tical sizes of a few square meters, sometimes more. This means, in my opinion, that field-work methods have evolved more toward technically spectacular solutions instead of toward greater analytical precision. Unfortunately and paradoxically, these methods - which should theoretically entail arduous analytical investigation in the field - have started to lose their validity, so that the interpretation of a context may depend on the basis of a single unverifiable decision. What makes matters worse is that decisions concerning stratigraphy often have to be taken by relatively inexperienced assistants, or even by fieldworkers. No other discipline, to the best of my knowledge, treats its primary sources in such a cavalier fashion. Archaeology's primary sources of information - and this is the point I wish to emphasize - are the layers themselves. These are inevitably destroyed as a result of excavation, so we have to investigate them properly.

In this lecture, I would like to present an alternative method of field-work and examine its consequences for post-excavation analysis. This method is based on two fundamental strategies. The first is that archaeologists should ensure the possibility of controlling the accuracy of their decisions, in order to correct any mistakes they might make during excavation. The second calls for detailed analysis of the individual layers, so that each deposit can be given a precise characterisation. As examples, I would like to discuss a number of excavations carried out in Norway: Finnegården 3A and Dreggsalmenning 14-16 in Bergen, and Oslogate 6 in Oslo.

The earliest of these was Finnegården 3A where, owing to various circumstances, a large part of the site had to be excavated in a series of slices, the excavation of each slice resulting in a new profile (fig 1). This meant, by a happy twist of Fate, that it was possible both to observe the behaviour of the layers and to compare cross-sections of deposits accumulated under different conditions. The description of the layers followed a standardised system. As well as lists of components, the Finnegården form included sets of compositional attributes whose analysis was intended to facilitate the final characterisation of the investigated layers (fig 2). This standardisation was all the more necessary because the excavation area in fact consisted of three separate trenches, and the system had also to be capable of

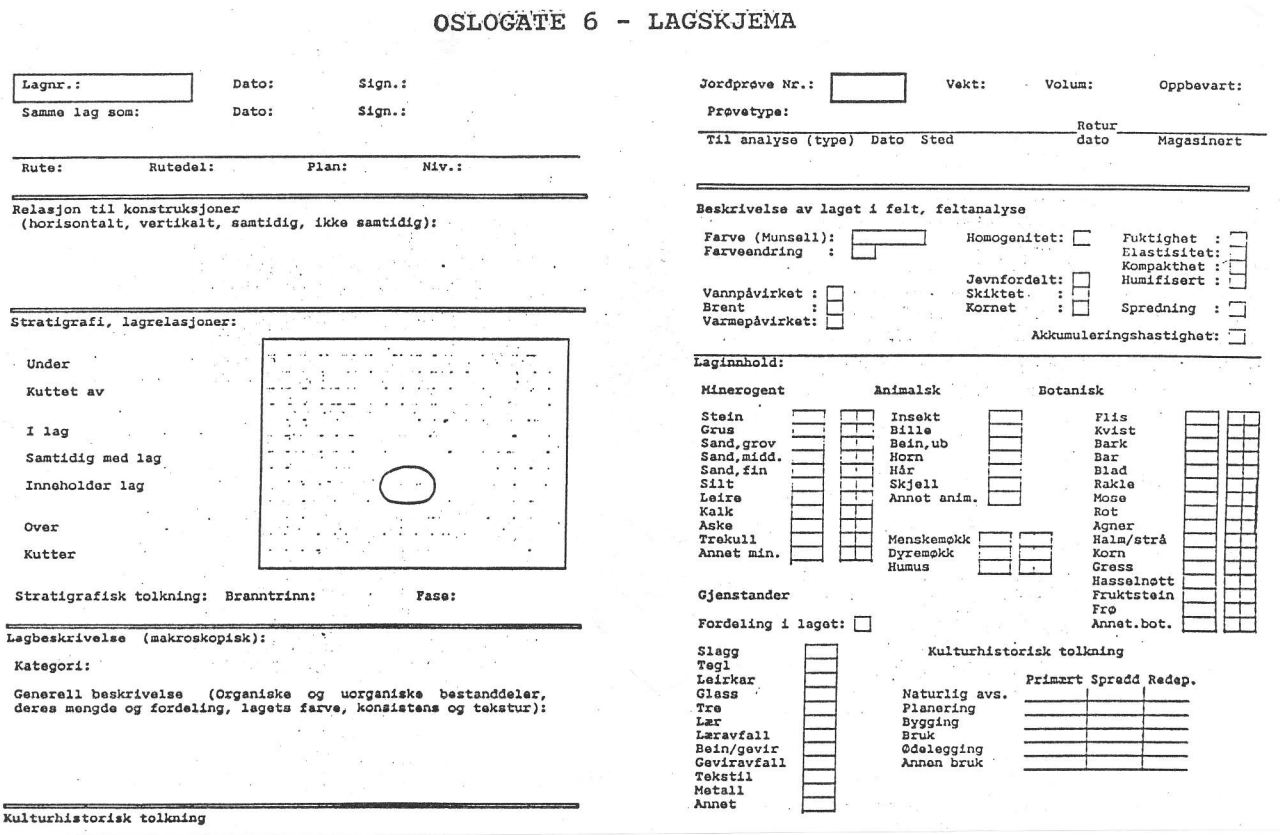

Fig 3. Oslogate 6, The layer description form.

keeping track of any changes in the layers in each successive slice. But it must be stressed that the system was still relatively subjective, because there was no precise quantification of the layers' compositional attributes. The main emphasis was on the morphological attributes of the layers, and this was basically a reflection of the fact that the idea behind the form, including most of the attributes to be examined, was adopted from a system for the description of Quaternary deposits (Troels-Smith 1955). But factors such as the distribution and relationships between different groups of components and artefacts - in other words, factors that help to reveal the dynamics of accumulation - were almost completely ignored.

Based on the results of the field-work, it was possible to reconstruct the site's depositional history. A wide variety of different layers was identified, including dumped refuse, primary accumulations along the shoreline, levelling layers, layers deposited to fill in and stabilise large timber foundations, layers accumulated during breaks in the process of building, spread firelayers, and so on. This excavation clearly revealed the complexity of stratigraphy in an area that was primarily tidal at the time of its first settlement. In combination with the results of the nearby excavation at Finnegården 6A, which was basically part of the dry-land area, this reconstruction provides a unique base for further detailed analysis.

The same standardised approach to layer description was applied during the excavations at Oslogate 6, where it formed part of an expanded system designed to promote even more specialised analysis of the layers' composition. One of the principal features of the form used at Oslogate 6 involved detailed description of the various components found in each layer, based on extremely precise field ana-lysis (fig 3). In accordance with the excavation's organisation, the process of description was divided into two steps. The first step concerned analysis of the layer's macro-structure, partly based on information provided by the person responsible for the layer's excavation; the second consisted of minute examination of selected samples. This dual approach proved to be the most practical way of doing things, as regards both the analysis itself and the conduct of the excavation in general.

The form used in Oslo contained some crucial innovations, especially concerning the final characterisation of each layer. The most important of these were procedures for ascertaining the layers' speed of accu-

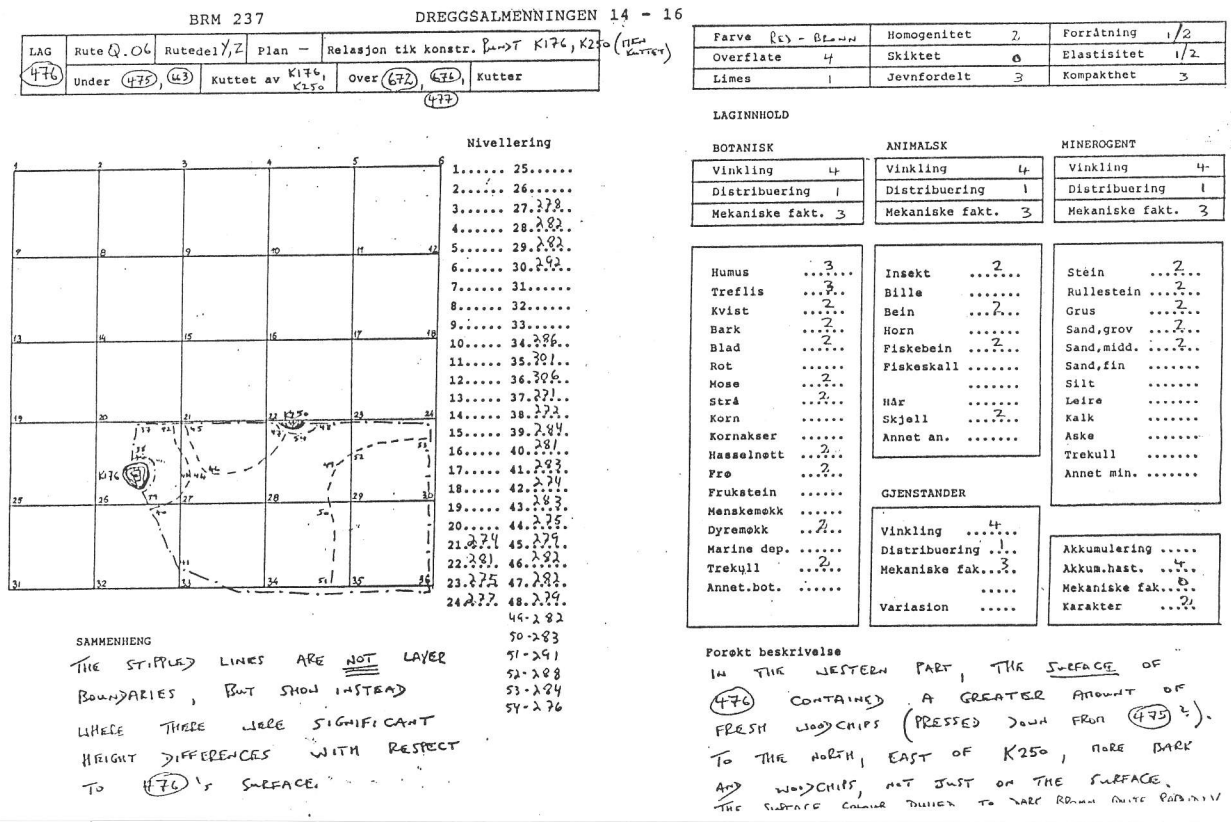

Fig 4. Dreggsalmenning 14-16, The layer description form.

mulation, and for determining the original character of redeposited layers. Nevertheless, the emphasis remained very much on morphological description, in even greater detail. This included precise determination of the relative proportions of the various components, together with their dimensions and degree of preservation. All in all, despite the abovementioned innovations, the Oslogate form provided more for the description of the layers rather than for their characterisation; as a result, and especially in the absence of exact quantification of the different features, this makes it difficult to undertake more detailed comparisons of the layers. On the other hand, because of the site's archaeological importance, resulted by both: state of the site's preservation and accuracy of the investigations, further detailed study of the stratification is in every respect desirable. For example, my preliminary estimates of the rate of accumulation of the Medieval layers at Oslogate 6 indicate that the total time of accumulation actually represents about one-twentieth of the site's entire history of use.

The final site I would like to present is Dreggsalmenning 14-16 in Bergen. The supplementary excavations in 1990 covered a narrow strip of land along the northern border of the area excavated in 1986. The site's position, shape and state of preservation, combined with difficult working conditions, made it necessary to use different methods when excavating the various parts of the site, which meant that the work was technically complicated. The same standardised system of layer description was used but, in order to take account of various factors, the form was simplified to a certain extent, mainly as regards the description of components (fig 4). The list of principal attributes, and the set of characterisations, were retained unchanged from the Oslogate 6 form. This time, however, the system finally provided for the quantification of the layers' attributes. Inevitably, there was a certain amount of inconsistency, but this first experiment in applying quantification to layers will surely induce further improvements; the results of the 1990 excavations certainly appear to support this supposition. It seems we have at last produced a form that, with only a few minor reservations, makes it possible for us to record the important aspects of each layer (its morphology and structure, together with the cultural and non-cultural processes to which it was subjected), and to do so without

being utterly drowned in details.

The list of quantifications looked as follows:

Colour : Primary colours + two variations (light and dark)

Surface
0 - regular
1 - lenses (undulations)
2 - lenses with sharp angles
3 - uneven
4 - uneven surface with sharp angles

Limes (transition)
0 - sharp difference between investigated layer and underlying layer
1 - mutual interference to a depth of 2 mm.
2 - mutual interference to a depth of 5 mm.
3 - mutual interference to a depth of 1 cm.
4 - mutual interference to a depth of > 1 cm.

Homogeneity
0 - one component with unvarying physical structure
1 - one component with variable physical structure
2 - different components with unvarying physical structure
3 - different components with variable physical structure
4 - groups of different components with variable physical structure (multilayer)

Lamination
0 - absence of horisontally deposited groups of components
1 - horizontal components in compact or granular structure
2 - groups of components in relatively well-defined horizontal lenses or "horizons"
3 - as for "2",but displaying stratigraphical order
4 - multilayer (eg latrine deposit)

Cohesion
0 - loose granular structure
1 - distinct components overlap each other, but still loose
2 - block crumbles under pressure
3 - distinct components and humus in a "mass" structure
4 - humus "mass" structure

Preservation
0 - 100% definition (no decomposition)
1 - 75% definition
2 - 50% definition
3 - 25% definition
4 - less then 25% definition (almost complete decomposition of organic components

Elasticity
0 - absence of "sponge reaction" (plastic or loose)
1 - slight reaction, but still plastic or loose
2 - visible reaction
3 - almost sponge reaction
4 - more then 90% sponge reaction

Compactness
0 - loose structure (not possible to remove a block)
1 - components easily separated (block cannot retain its shape)
2 - components become separated during breaking of block
3 - components remain in block during breaking
4 - block difficult to break

Inclination (components and artefacts)
0 - impossible to define
1 - 75% (or more) of components (artefacts) in horizontal position
2 - 50% (or more) of components (artefacts) in horizontal position
3 - greater part of components (artefacts) are angled at 45 or more
4 - components (artefacts) are inclined completely at random

Distribution (components and artefacts)
0 - impossible to define
1 - components (artefacts) uniformly scattered throughout layer (both in plan and in section)
2 - non-uniform distribution, but not concentrations
3 - components (artefacts) in concentrations with irregular extent (plan/section)
4 - components (artefacts) in concentrations with regular extent(plan/section)

(In fact it seems to be necessary to ascertain the inclination and distribution for organic components, mineral components, and finds separately).

Mechanical factors (for components)
0 - impossible to ascertain
1 - absence (undisturbed natural accumulation)
2 - heaped up
3 - spread
4 - burnt

Mechanical factors (for artefacts)
0 - impossible to ascertain
1 - washed out

2 - crushed (in groups)
3 - crushed and spread
4 - burnt

Relative frequency of components (for description of the layer's composition)
0 - absence
1 - single
2 - presence
3 - significant
4 - dominant

Characterisation

Speed of accumulation/deposition
0 - impossible to ascertain
1 - slow continuous: natural accumulation or other processes
2 - continuous: result of a specific activity
3 - fast continuous: result of a specific activity
4 - redeposited

Mechanical factors (for layers)
0 - impossible to ascertain
1 - absence
2 - erosion
3 - scorched
4 - burnt

Character
0 - natural
1 - occupation
2 - levelling
3 - building/stabilizing
4 - firelayer

Based on analysis of the stratigraphy and the character of the layers, the 1990 excavation-area at Dreggsalmenning 14-16 can be divided into three parts: an upper part, with intensive settlement; a central part, which was almost entirely neglected; and a lower-lying area, which revealed traces of an irregular settlement pattern. The stratigraphy of the separate parts was formed in different ways (fig 5).

Of these three areas, the lower one is most suitable for further consideration. It consisted of three adjacent squares, P.06, P.07 and Q.06, none of which were stratigraphically alike: there were significant differences in, firstly, the number of phases, secondly, the number of firelayers present, and thirdly, the general character of the layers. In the latter case, differences were registered not only from square to square, but also from phase to phase - in other words, both spatially and chronologically. Some pha-

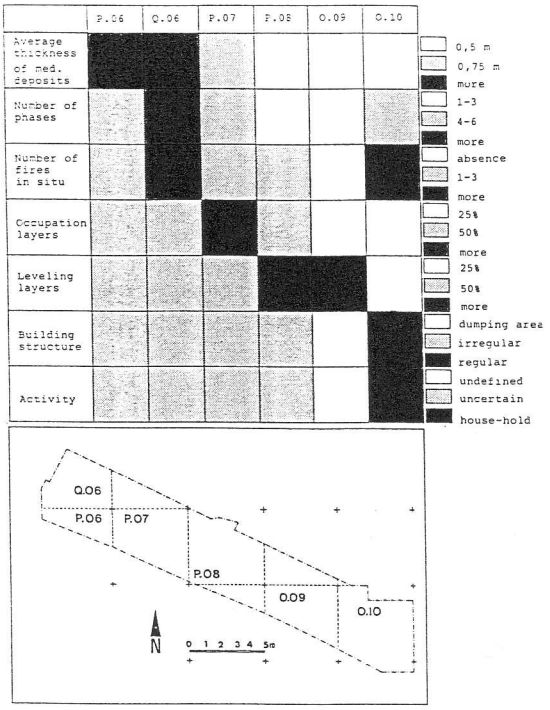

Fig 5. Dreggsalmenning 14-16, The graphic characteristic of the site.

ses consisted mainly of redeposited layers, while others contained deposits indicative of continuous accumulation. In one case - here in phase 6a - a firelayer was found directly on top of a redeposited layer. These and other minor problems complicate both the stratigraphy and its further analysis.

In the lower area at Dreggsalmenning 14-16, layers belonging to all three types of levelling deposit (described at the start of this article) were present (fig 6) - compare the stratigraphical position of the exposed structures, (fig 7). On the schematic model of stratification, layers of the first type ("daily levelling") are marked by signature number II. These layers should be interpreted as occupation deposits. The difference between them and the layers called as number III concerns their respective rates of accumulation. Layers belonging to the second and third types ("local" and "structural" levellings) are shown by signature number IV. Distinguishing between these two types during excavation can be difficult, but precise analysis of the layers' morphology, structure and other physical attributes - not forgetting the distribution of finds - can provide satisfactory results. In this case, analysis indicated that the majority of layers belonged to the local-levelling type, which strengthens the supposition that this area was on the periphery of the Medieval town. Only one layer, number 482, attested to large-scale levelling activity; this in turn implies that the under

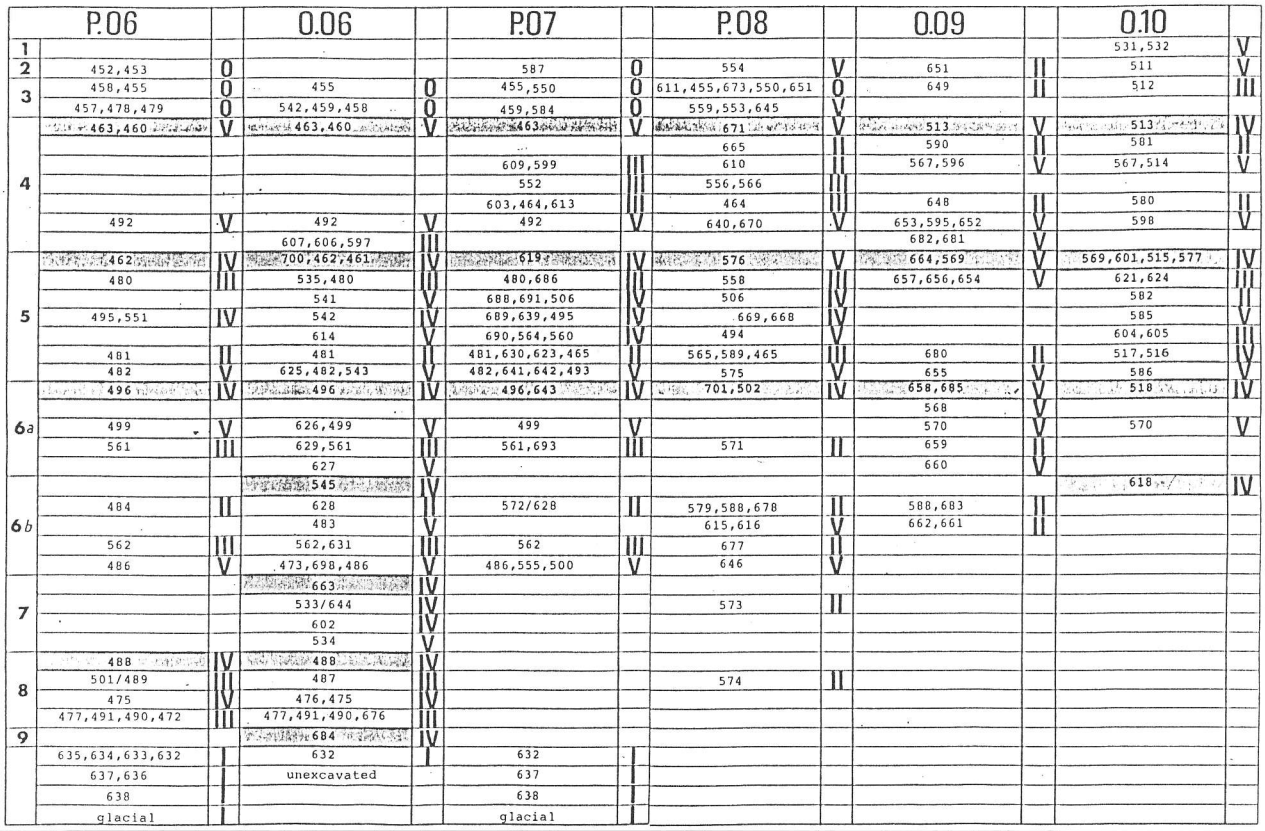

Fig 6. Dreggsalmenning 14-16, The model of the stratification process of the excavated area (layers in horisontal "windows" are in stratigraphical order and represent the same type of layers. Blank "windows" show stratigrafical disturbance. 0 - undefined, I - natural accumulation (slow continous), II - continuos, III - fast continous, IV - redeposited).

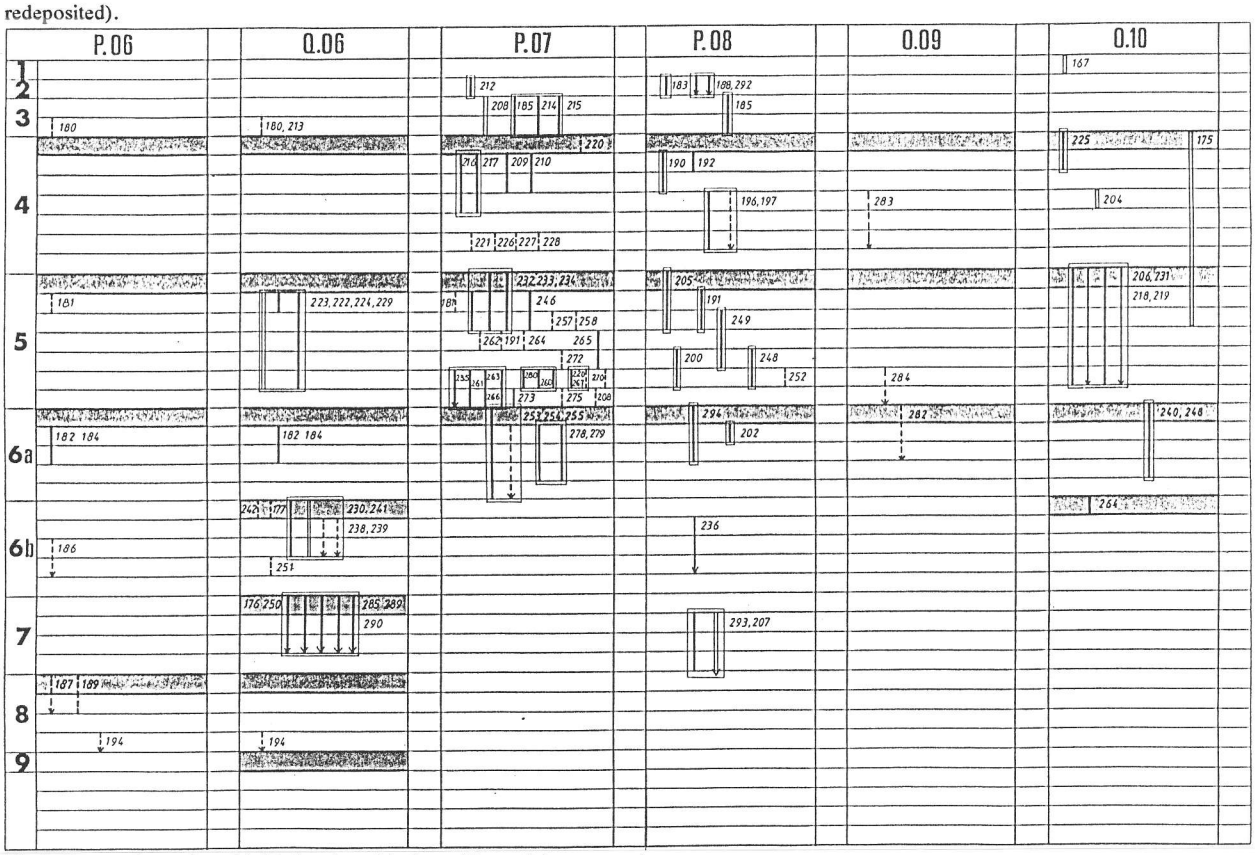

Fig 7. Dreggsalmenning 14-16, Stratigraphical position of the exposed structures.

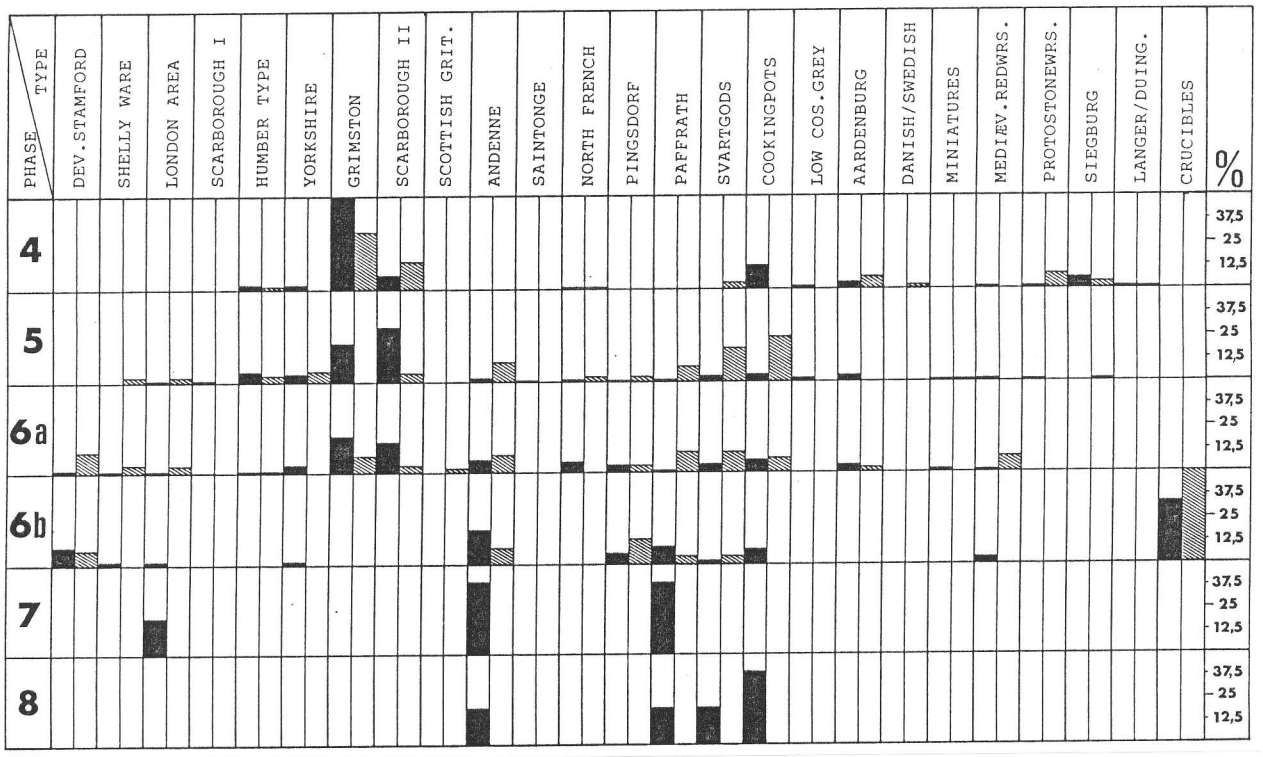

Fig 8. The sherd count of various pottery types found in the accumulated (in black) and redeposited layers (pottery types ascertained by R.A.Dunlop).

lying firelayer, 496, was part of a major fire. This piece of evidence, circumstantial though it may be, can be of significance when it comes to correlating the archaeological firelayer with an historical event. Figure 8 which shows the sherd count of various pottery types found in the accumulated and redeposited layers of the successive phases at Dreggsalmenning 14-16, may help to illustrate the problems involved in dating a complex stratigraphical sequence.

I have mentioned only some of the benefits to be gained from the method outlined above, and I do not have enough time to advance additional arguments in its favour. I know that there are still doubts in some quarters about the accuracy of in-the-field interpretations of the characters of layers, and I do not deny that there is always room for improvement. The main thing is to agree upon the importance of this aspect of archaeological field-work, as well as the importance of being able to check up and verify our decisions.

The interpretation of stratigraphical data depends on the archaeologist's being able to identify which layers were directly associated with activities taking place in each successive phase, or at least being able to assign a degree of probability to such an association. This means, in practice, *knowing the character of the layers and the way in which they were formed.* With-out this - and, in my opinion, there is no alternative - the validity of our conclusions will always be in doubt.

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