

D.V.DEOPIK

ON QUANTATIVE ANALYSIS OF EPIGRAPHIC RECORDS

The bulk of medieval epigraphic documents is the most promising material for applying methods of quantitative treatment of sources. The study of ancient and medieval documents can boast many achievements even without applying quantitative analysis. However, investigation by a single programme of all documents of a given society or a group of kindred societies covering a sufficiently long period of time gives the most close and real picture of the past, making it possible to study a definite phenomenon by the maximum number of its signs, especially the most elementary of them. At present quantitative analysis can be applied first of all for studying medieval documents.

The main problem concerns the study of mass data, with its two aspects; a) the external aspects concerning relationship to other types of sources containing information, which shapes the approach to the investigation of socio-economic development and b) the internal aspect concerning the system of description and the set of methods used. Within this framework there are two approaches to the relationship «feature—investigated society»:

(1) Analysis of a large number of the signs of minor natural complex and summing up the obtained characteristics of these complexes (e.g. economies) for obtaining general idea on a given society.

(2) Analysis of a smaller number of signs over the entire territory of the investigated society and over a longer period for the same purpose.

The second approach includes two different views concerning the list of the signs of this or that phenomenon common to the society as a whole. In one case the investigator proceeds from top to bottom, from general concepts to more and more specific ones, to detailed signs, while in the other case he proceeds from below, from formalised descriptions of concrete situations to gradual association of the initially obtained elementary signs into larger general groups.

Let us first deal briefly with the first aspect and then proceed to the second, basic aspect. The connection with other types of information raises the problem of studying general estimates made in the Middle Ages and contained in narrative sources and also the problem of

investigating collections of standard rules or fragmentary references to the norms of the past concerning the economic sphere.

Let us now take up the relationship between communications of historians and information of documents. The traditional approach used by most scholars of the 19th and earlier centuries for describing events of a distant past was reproduction of more or less reconceptualized conclusions of the historians from that past, reliance on them. This approach took shape first with reference to political history and was then extended to the socio-economic sphere. This rather created a semblance of understanding the general situation than its real understanding. With advance in the criticism of the sources and with the development of history as a science this less and less suited the investigators. The defects of this approach became obvious to them when they launched extensive studies of narrative and normative sources compiled in medieval Asian states, which not only belonged to different periods but also to different cultures. Many communications made in the past in these societies and states were totally unacceptable or unintelligible to modern investigators, and the religions-philosophical foundation of these communications to this day remains largely unclear. It seems that with reference to societies the study of which began comparatively recently, generalisations made in the traditional environment should be taken up only after reproducing the picture of socio-economic development through analysis of mass elements of the textual content of business documents. This is true even of the richly documented Chinese medieval society.

Another large-scale variety of «non-documentary» information includes collections of economic regulations in various juridical records and fragmentary references to such regulations in the narrative sources or documents. These regulations are closer to the facts than historical narration, since the very task before the compiler of a text is more specialised. However, economic thought in many Asian countries generalised practices along ways which are likely to remain largely unintelligible for a long time. This is particularly clearly exemplified by India (where the provisions of the juridical collection Arthashastra are most poorly reflected in epigraphic documents) and, partly, by Java. The result was considerably divergent pictures obtained through separate analyses of normative collections on the one hand, and documents, on the other.

Such is, as we see it, the relationship between mass data of epigraphic and other sources.

Basic in this case is the second aspect, the internal one – the system of description and methods of quantitative analysis of the socio-economic information presented at a large scale in epigraphic documents. A single elementary fact in socio-economic studies is insufficient not because of its accidental nature or possible unauthenticity but because it permits several different interpretations (a single case of purchase and sale, for example). There is need for a system of socio-economic facts tracing links between them which are not inherent in one elementary fact (for instance: «X gave the land to Y»). In this respect studies of social structure differ from the studies of civil history for which reference to any event reaching us in the only extant text is accepted without «checking of mass recurrence» if it is compatible with our common-sense and the available information and is not refuted by criticism of the text. In socio-economic studies there is also the problem of simplicity of a separate fact impeding interpretation and also the problem of a fact which undeniably occurred but which is very rare and therefore untypical for its time.

The basic and primary thing here is the mass scale of socio-economic documents. Different external information about the socio-economic structure, just as scant document references to complex, unique socio-economic phenomena as well as fragmentary in formation of normative character – all this should be investigated in the second place, whatever readymade (1) ancient communications, intuitively seeming correct, they might contain. Mass data in this case are always primary, since conclusions from their analysis help to trace the general links. These conclusions make it possible to estimate the reliability of communications in normative sources and general characteristics of the social structure in narrative sources, the degree of cultural reworking of particular objective phenomena in the consciousness of medieval society.

Definite experience in applying quantitative methods has been accumulated in the study of European medieval documents. But in the study of medieval Europe quantitative methods (and at times also analysis of mass material in general) are to this day destined to have an auxiliary character, for quite a lot is already known (or there is a long-standing assurance of this). Basically, they are employed in the study of narrow territories, short periods of time and partial problems. General reconstruction, like those done by K.V.Khvostova¹, are few and far

¹ Khvostova K.V. *Osobennosti agrarno-pravovykh otnoshenii v pozdnei Vizantii (XIV-XV vv.)*. Istoriko–sotsiologicheskii ocherk. (Peculiarities of Agrarian-Legal Relations in Late Byzantium /XIV-XV o.o./). Historico–Sociological review). M, 1968.

between. This determined the choice of methods and the presentation of problems many of which, including those of a general historical character, can be posed only on the basis of the facts of the European Middle Ages.

It is most advisable to put quantitative analysis of mass documentary material at the basis of socio-economic reconstruction when it is used for solving the entire set of problems of socio-economic history (even though the depth may be limited by the potentialities of the sources). In this case the entire complex of tasks is solved first on a quantitative basis. As the insufficiently studied societies are concerned, it is in general impossible to go straight to analysing particulars. The investigator has to draw up a general picture for himself from the very beginning and this is done 'more easily by means of quantitative methods.

Turning to the set of concrete problems connected with the employment of quantitative methods in the study of medieval Asian societies, we should point out that this is the least painful way of incorporating the historical experience of these countries into the general picture of development, for the simplest quantitatively treated economic material is most uniform in different societies (in contrast to the forms of spiritual culture, social organisation, etc.).

Let us deal with the procedures of analysing mass material contained in economic documentation on the basis of epigraphy of Southeast Asia, a region close at that time to Europe in the size of population and cultivated areas as well as in the diversity of the forms of socio-economic organisations, which was far greater than in India or China.

The basis of the proposed conclusions is quantitative analysis of full epigraphic complexes of four countries (analysis of all elements of the text was done for Java, Kampuchea and Tiampa and analysis of some elements of the text for Burma). The period covered is the 4th-15th centuries i.e., the entire period when economic epigraphy was in vogue in Southeast Asia. Other countries of Southeast Asia either did not have class relations at that time (The Philippines) or did not use «everlasting» materials for business documents (Vietnam) or else epigraphy records are few in numbers (Mons of Central Indochina, Malays of the Malacca Peninsula and Sumatra).

The basis of quantitative investigations of mass material of epigraphics is the breakdown («run-down») of the text or, rather, its economic part. As demonstrated by thousands of inscriptions in four countries and over twelve centuries, 95 per cent of the content of this part of the text (not counting the toponyms and proper names) is rather uniform and, even though not frequently recurrent, clearly belongs to one of the classes of elements

constituting the «simplest communication» (SC further on). The remaining 5 per cent are closely connected with the text and describe more complex links, as we have already said.

The run-down is carried out after the division of the entire economic part of the text, constituting a natural and easily distinguished part (called "the text" further on), into «simple inscriptions». The «simple inscription» has a concrete person or a group of such persons making a gift. Many documents, especially on stone, contain a series of gifts made to one object at different times i.e., several «simple inscriptions», or mention previous gifts and these references too are treated as «simple inscriptions». «Simple inscriptions» are divided into SCs having the form of uniformly construed statements which consist of the consecutively arranged Subject, Relation, Object, Thing (relation) and Circumstance (relation). Each SC has only one Subject, one Thing, etc. Thus, a simultaneous group gift by three persons means three SCs. The «simple inscription» too has several formal characteristics: time, place, language of the text, material of the inscription, degree of preservation of the text.

With the help of sign elements we uniformly describe the types of SCs formed by different combinations of elements. The list of connotations of each sign element or its types is a list of all words of the text designating (with the reservations as shown below) the Subject, etc. The text is not distorted by any additions, for the scheme of the «simplest communication» (SSC) contains the same categories as the initial text (IT further on). But a part of information, as we have already said, is not included into the SSC on account of its complexity and, as established, small recurrence. It is given in the Note (this includes various forms of association of several types of the Subject in one action, identification of different forms of ownership by the author of the text, etc.). How objective is the dividing line between the Circumstance and the Note (for other elements the distinction is not difficult) ? This is determined purely quantitatively: if a given word (or a group of grammatically related words) recurs of ten, i.e., more often than a definite number of times, and in definite contexts, it is the Circumstance. included into the Circumstance are expressions which, though appearing rarely, are terminologically or economically similar to some expression already accepted as the circumstance (for example, the frequent «as untaxed possession» and rare «as untaxed possession of the Ganjara class»). The list of the Circumstances may gradually grow owing to more frequent Notes. But, as demonstrated by experiment, this happens rather seldom. The list of the Circumstances proved to be sufficiently brief in all groups of countries and it was almost not at all supplemented from the Notes. With reference to the Circumstance important too is

consideration of types of Circumstance formulation constituting kindred groups compared with the unsystematic list of the Notes. And, what is very important, the number of Notes is small, since in mass documents uniformity and general intelligibility are an obligatory condition. In the Java and Khmer epigraphy only about 5 per cent of SSCs have Notes.

The number of Notes increases to some extent with the growing complexity of the content of a document. In general, the problem of differentiating the growing complexity of the document and detailed description in it, on the one hand, and the growing complexity of relations themselves, on the other, is very complicated, the more so since both processes of growing complexity are in most cases interconnected (prolonged growth of complexity of relations with the initial form of the document remaining unchanged is most unlikely). A great role is played by the linguistic formulations of the initial text which should not be disunited by the investigator. If one ancient Javanese word means «to exempt from taxes», this word with its complex meaning will be treated as a definite special type of the Relation and the Thing in this SC -will be absent. But if the expression «to exempt from the tax» is followed by the name of the tax (say, «titibana») in the initial text, then «titibana» falls into the Thing column, in the analysis of the Relation the corresponding word will be referred to the group of «immunity» types in both cases, but in the first case «without detailization» and in the second «with detailisation». These different phenomena may be investigated separately. It may be taken as a rule that two stages precede the analysis of the SSC;

A. Analysis of formal signs of the text as a whole.

D. Analysis of SC elements separately.

At both stages account is taken, above all, of what we know about the civil history of the given society during the studied period of the Middle Ages and about its traditional socio-economic structure at the end of its existence, in the 18th-19th centuries, as it is described by ethnographers and economists. Fragmentary information about the socio-economic structure of the society in question contained in its narrative and normative sources, just as generalisations of contemporary schools, made on the basis of individual documents, or by analogy, or on the basis of a general survey, are brought into use only later.

Let us consider Stage A. The formal signs of the text as a whole include; the time of the inscription (and its parts, if any), the place of discovery (erection), the language of the initial text, material of the inscription, the degree of its preservation, whether it is original or a copy. These simple indisputable characteristics yield a vast amount of new information about

societies which left these documents, even about their political history, let alone socio-economic processes. An example of this may be the periods revealed for the Khmer and Javan states when economic activity (estimated through the volume of land redistribution) stopped completely for centuries. In areas once distinguished by a large number of land gifts etc.—and often this was the capital area. For a long time no information was available from there in the form of documents, though several centuries later they reappeared. Often within the time framework of the existence of epigraphy in a given country it is never revived in such an area. Information about events of civil history continue to issue from such areas. By the 18th century in all such areas of Southeast Asia we see a dense peasant population clearly living there for a long time. Consequently, the cause of the disappearance of epigraphic documents was not soil depletion and exodus of the population. It remains to assume discontinuation of land transfer to the clergy in definite areas. As for the general decline of «business epigraphy», it is connected with changes in the property status of the clergy of the new religions spreading from the 15th century and with the fact that, beginning with the same 15th century, the main accumulator of land in Southeast Asia increasingly became minor secular feudal lords without any titles whose rights were fixed not on ever-lasting materials but in a more simple way – on palm leaves and often in the form of semiliterate notes recording colloquial turns of speech, etc. (mortgages by Burmese peasants in the 18th century investigated by A.S. Agadzhanian²).

Some aspects of the rise of zones of absent business activity («sleeping provinces») were studied in our literature with reference to Kampuchea³, Burma⁴ and Java⁵. In this

² Agadzhanian A.S. *Derevnya i provintsialnoye chinovnichestvo v dokolonialnoi Birme* (The Countryside and Provincial Bureaucracy in Pre-Colonial Burma). M, A Theses. Moscow University, 1981.

³ Deopik D.V. «Epigrafika i karta (Epigraphy and the Map)». – in: «Karta, skhema i chislo v etniocheskoi geografii» (The Map, Scheme and Number in Ethnic Geography). M, 1975, pp. 3-16.

⁴ Deopik D.V. «Problemy metodiki issledovaniya epigraficheskogo kompleksa primeniteino k zadacham sotsialno-ekonomicheskogo analiza (po materialam birmanskoi epigrafiki) (Problems of Methodology of the Study of the Epigraphic Complex with Reference to the Tasks of Socio-Economic Analysis /based on the materials of Burmese Epigraphy/». – *Vestnik Moskovskogo Universiteta. Vostokovedeniye*. №. 2, 1977. pp. 30-41.

⁵ 5. Kullanda S.V. «Nekotoriye osobennosti sanskritskoi epigrafiki Yavy (opyt kollchestvennogo analiza) (Some Peculiarities of the Sanskrit Epigraphy of Java /Experiment in Quantitative Analysis/». – In: *Sanskrit i drevneindiiskaya kultura* (Sanskrit and Ancient Indian Culture).

connection undertaken was the study concerning the stages of «the emerging property relations (the spread of relations of a class society to the formerly preclass neighbouring peasant districts inhabited by people of the same ethnos⁶), and the real meaning of ranks and titles⁷, was specified.

These and other conclusions follow from the analysis of the most elementary signs of the epigraphic complex. These regularities become noticeable even with a small quantity of inscriptions, smaller than could be expected according to the law of probability, in other words, in this sphere (land relations) accidental deviations from the norm, with the accepted degree of detail in description, were lower than normal deviations from the average.

Let us turn to Stage B. A big role, both in the analysis of the material as a whole and in the analysis of the SSC, is played by the previous analysis of each of the SC elements separately. An element is treated as a sign with a list of meanings (types of the element) established by the text. The list of SC elements was already given and let us recall it: Subject, Relation, Thing and Circumstance. The list of meanings of each element sign is a list of types (Subject, etc.) and is filled in the course of running down the initial text in the chronological order (in this way, already in the process of the arrangement of the initial text, it is possible to establish approximately the share of what type grows and declines, what type replaces others or other type). Upon completion the list of type meanings of the sign is rearranged according to the terminological affinity of the names of types, and groups of types are formed. It will be

Part II. Moscow, 1979. pp. 23-30; Deopik D.V., Kullanda S.V. «Prosteishiye priznaki yavanskogo epigraficheskogo massiva VII – nachala X w. kak istochnik po istorii rannesrednevekovoi Yavy (The Simplest Signs of the Javan Epigraphic Complex of the 7th – early 10th Centuries as a Source on the History of Java of the Early Middle Ages)». – In: Etnicheskaya istoriya narodov Vostochnoi i lugo-Vostochnoi Asii v drevnosti i v sredniye veka (Ethnic History of the Peoples of Eastern and Southeast Asia in Ancient Times and the Middle Ages). Moscow, 1981. pp. 279-301; Kullanda S.V. "Vzaimodeistviye geograficheskikh i ekonomicheskikh faktorov v razvitii traditsionnogo malaiskogo obshchestva (Interaction of Geographical and Economic Factors in the Development of the Traditional Malay Society)». – In: Karta, skhema i chislo v etnioheskoi geografii. pp. 17-22.

⁶ Deopik D.V. *Istoriya Kampuchii (The History of Kampuchea)*. Part 1. Moscow, 1981. pp. 35-36, 38-39.

⁷ Deopik D.V. «Tipy sotsiainoi terminologii khmerov (VI-XII w.) (Types of Social Terminology of Khmers /6th~12th Centuries/)». – In: *Problemy tipologii i etnografii (Problems of Typology and Ethnography)*. Moscow, 1975. pp. 105-115

remembered that the -type is a term or a stable combination of two and, more seldom, three terms capable of independently playing the role of the SC; an independently occurring term observed earlier only in stable combinations forms a new type. Within type groups various types are distributed by the time of functioning (early types occurring throughout the period and later types). The arrangement of groups is followed by analysis of the special-temporal characteristics of types and groups of types (Subject, then Relation, etc.). In the analysis of the Subject, for example, completely discounted at this initial stage of investigation is their combination with particular types of Relation, Object, etc.

Experiments have shown that the number of types constituting each element and sufficient for describing the respective aspect of the agrarian economy varies from 40 to 100 for time stretches of seven-eight centuries. This number is rather small and is determined, apparently, by the nature of ownership documents requiring uniformity and by the stability of agrarian relations in the investigated societies of the 6th-15th centuries which were at the stage of early and developed feudal relations.

After the separation of types and groups of types (and subgroups of types, if any) the degree of their recurrence is evaluated in the first place: a) by the number of references in the SSCs; b) by the number of inscriptions mentioning the given type. The second number is smaller than the first or is equal to it and it is more advisable to use it in the analysis of the special-temporal characteristics of a particular element taken separately, since the details of the inscription (the number of SSC in one inscription) are a variable as demonstrated by the experiment. It is usually small at the beginning of the studied period, when «business epigraphy» just emerged, and then increases. But in some cases, at the end of the period of «business epigraphy», it reaches the maximum (for Instance, in Java in the 14th-15th centuries) and in other cases declines (for instance. In Cambujadesh in the 12th-13th centuries).

It should be pointed out that in most cases types were referred to this or that element of the circumstance (say, to the Subject) on the basis of their place in the SSC. After the arrangement of the majority of types by elements depending on their place in the SSC the list of types of each element was supplemented by types terminologically or semantically kindred to the types already included into the list but occupying different places in the SSC. Within a terminologically kindred group of types the overwhelming majority of types were always found in one and the same place, the place of a definite SC element: there was no problem as to where, to what element a whole group of kindred types should be referred. Having established

by this procedure that the majority of persons mentioned as Subject belong to secular persons and the majority of persons or organisations taking the place of Object belong to the clergy, we view all secular persons as Subjects and all clergy as Objects. Thus, the Subjects include also representatives, though in negligible numbers, of lower social secular strata which did not make gifts but which acted as Objects or even Things, and the Object includes categories of the clergy sufficiently often making gifts themselves.

With the same types of Relation there may appear types referred to one of the elements in the place of another element (a type from the Subject list in the place of Object, etc.). The majority of types forming part of the Subject, Object and Thing, are never found in this situation at a «strange» place. Sufficiently many of them do this seldom, some in the majority of cases and very many always. This phenomenon is defined as «inversion», if is not inversion when the character of Relation (and there are very few such Relations) implies a change of places by the Subject and Object (e.g., instead of the usual «The Monarch gave land to a person» there appears the rare «A person received land from the Monarch»), in our experiments inversion always concerned only a smaller part of types and usually only at definite stages of the studied period. It did not interfere with the realisation of the «logical principle» of reduction of types to the list of this or that element. On the contrary, recurrence of inversion helped to reveal specific groups of types within an element. Quite of ten, they possessed also other common traits, inversion yields interesting characteristics of particular periods. In the main, the foregoing concerns inversion from the Subject to Object and vice versa and, to a smaller degree, to the Thing and, seldom, to the Circumstance. Relation is almost fully free from inversion. Inversion links together not all elements, and this provides one more criterion for checking the objectivity of the differentiation of elements In the SC. inversion is a consequence of two different processes, one of them related to the evolution of the studied societies and the other to changed descriptive potentialities of the system of description of agrarian relations chosen by a given society. In the former case inversion shows how socially active groups of persons making land gifts in the course of time, for example, cease to make gifts or even become Things of gift-making themselves. This is a case when a type changes its social status. But if inversion embraces a larger part of type lists for different elements, if new types appear in sufficiently large numbers In different elements not kindred to already known types, and old types in sufficiently large numbers are subjected to inversion or disappear, this sneaks of the exhaustion of the descriptive potentialities of the system of description earlier adopted by

society. This means that the system of description created by society at the beginning of the time of document functioning (this is the starting part of the Initial Text for the investigator) gradually loses the ability to serve a given society, that a transition began to a new system. This is signalled by the simultaneously appearing mass inversion and mass disappearance of widespread types. It is significant that this phenomenon, being an important feature of evolution of the studied society, can be traced with the help of formal procedures. It is still too early to appraise such phenomenon as exhaustion of the descriptive capacity. But already now we can' say that this does not happen simultaneously for all elements, that the temporal framework of inversion systems of description prior to the transition to a new system covers several centuries and that recombination of initial elements enables society to describe new forms of agrarian relations without any marked changes in the list of types. But when the descriptive potentialities of a system begin to run out, the main change in the form of the document takes place some time before the beginning of mass inversion. The initial depletion of this sort is, possibly, reflected in a greater detail and a parallel increase of the number of types.

The most sensitive mechanism for describing agrarian relations is analysis of combinations of elements, analysis of the SSCs. The complexity of element combinations contained in documents and relative abundance of SSC varieties lends urgency to the use of electronic computers precisely in this part. Here we enter into the sphere of concrete agrarian relations, which in the analysis of the Relation element figured only in part. It would seem that the number of combinations of elements constituting the SSCs must be exceptionally great, but the experiment has shown that this is not so. The share of recurrent SSCs is very great, immeasurably higher than assumed in the case of accidental combinations of types of different elements in the SSCs. The point is that the majority of SSCs are formulas or their parts really applied in practice and in this situation repetitions are inevitable. At the same time, they are not quotations from normative texts but really operative norms given in documents in their practical, usually elementary expression. By themselves they characterise society and definite stages of its development. Establishing the connections of SSCs in one document, the investigator obtains still more complex varieties of really existing economic relations. An example of this is the tracing of the formation of the social group of pan j is (small feudal landlord) and land-owning priests in Java in the 12th-14th centuries.

The next stage is comparison of the obtained characteristics of society with the data of epigraphy defying quantitative analysis of which we have spoken earlier, and also with the data

of narrative and normative sources, ethnographic data, etc. In their totality they give a picture of a particular society, but the foundation, in the analysis of the socio-economic structure of medieval societies is the mass simple information of documents which are best treated by quantitative methods.

Опубликовано в Seminar A – 5. The 31st International Congress of Human Sciences in Asia and Africa August 31st-September 7th, 1983 Tokyo and Kyoto. М. 1983