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The Byzantine Law Heritage and New Prospects of Its Information Research: The DataBase «Byzantine Law» (*)

Once formed the law became the most important instrument of the social control and the genuine phenomenon of civilization and culture. It is the aspect of the legislation that defines the potential of any legal codification as well as substance of law herself. The basis of it is founded on the effectual positive law. It is stated in written texts and fixed in norms and generalizations that are represented in the inward essence of the culture¹. In this regard the significant importance has analytical jurisprudence. This is a branch of the special knowledge on legislation and law norms, legal liability and responsibility and other aspects of legal relations, that is described in terms of their immanent logic, systems and characteristics. The achievements of the analytical jurisprudence having been risen to the highest level already in Antiquity were fixed in the legislation of Justinian. It was laid in the reliable founding of the analytical creative power of many generations of medieval commentators and glossators. The results of their presumptive studies had realized in the prominent legal systems. The most famous of them is Roman-German law². At the same time the Byzantine law requires the special attention. It presents the most significant direction of the three ones in medieval jurisprudence accordingly to modern scientific conception³.

Scientific problems, that the project of the construction of Database «Byzantine law» is designed to resolve, are undoubtedly inextricably associated with the obvious necessity of contemporary historians, lawyers, philosophers, culture researchers, philologists and specialists of other fields of science to study the Byzantine law heritage as the most important source of the political and social ideology, legal and religious consciousness of members of the society. In the history of human civilization Byzantine law thought was first manifestation of the ideas of anthropocentrism foreshortened at angle of the medieval understanding of Christian ethics and morality. The postulates

*) The project is accomplished with the financial support of Russian Fund of Humanities («RFH»: The Projects № 02-05-12023v and № 05-01-121128v). The participants of the present Projects would like to express the sincere gratitude for the support in its realization to the academician Gennadij Litavrin. The authors also tender thanks to participants of the mentioned projects Olga Tihonova and Dmitrij Kondratiev for the assistance and provided materials used at the article. The authorized translation is made by Nastasia Ivanova.

¹) S.S. ALEKSEEV, *Legal theory* (in Russian: Алексеев С.С. *Теория права*), Moscow, 1995, ID., *Law: Principles-Theory-Philosophy. Etude on the Complex Analysis* (in Russian: *Право: Азбука – Теория – Философия. Опыт комплексного исследования*), Moscow, 1999, and ID., *Legal theory: the Search of New Approaches. Ekaterinburg* (in Russian: *Теория права: поиск новых подходов. Екатеринбург*), 2000; V.S. NERSESIJANZ, *The General Theory of Law* (in Russian: *Нерсисянц В.С. Общая теория права и государства*), Moscow, 2000, and ID. *The Philosophy of the Law* (in Russian: *Нерсисянц В.С. Философия права*), Moscow, 2000.

²) ALEKSEEV, *Legal theory*, quot., p. 1 and so on; ID., *Law*, quot., p. 153 and so on.

³) N.M. AZARKIN, *The General History of Jurisprudence* (in Russian: *Азаркин Н.М. Всеобщая история юриспруденции*), Moscow, 2003, p. 167-168 etc.

of Byzantine jurisprudence contained an embryo of the doctrine of natural law. Thus they became the incipience of humanist thought and forestalling Renaissance and Modernity⁴. Legislation of the early period of the history of Byzantine empire also declared the idea of universal law and equality of citizens before the law⁵. The unification of property law and the reforms of hereditary, marriage and family law are served as the most important steps on the way of a social development⁶. The legislation of Justinian maintained the idea of firmness of private property through the fixation of ownership of women and other members of family⁷. Corpus Juris Civilis, having been the important sources to compile different models of European law in future, exemplified best the legislative manners of defense of personality in sphere of public and private law⁸. Evolving permanently throughout the centuries, the Byzantine law kept continuity of the norms of nature exploitation and regulation of neighborhood relations, conception of family and socialization of the youth as well as many other aspects of the social system. The social and cultural changes were embodied in famous legislative codes. They are characterized by integrality and completeness of legal postulates that were included in contents of ample corpora.

It should be noted that modern scientists attribute the legislative corpora to the newish legal forms, which had not existed in Antiquity⁹. The monuments of Byzantine civil law are revealed themselves for a student as indivisible continuity of codes systematized social norms in common. But it does not mean an absolute ideological identity of the legislative monuments of various periods of the history of Byzantine empire. On the contrary legislative codes demonstrate good examples of selectivity of the contemporary jurisprudence and interlacement of traditions and innovations in legal norms. Thus it is not sufficient to get simply acquainted with any particular monument, even if it is so fundamental as Digests, Code of Justinian and the «Librorum Basilicorum LX» («Libri Basilici»), or so reformed on its character as Eclogue of Leo III. Each of these corpora is represented as if the most complicated law system, required abundant and exuberant comments and supplements that had been made practically to every legal provision. Thereby the development of Byzantine law may be imaged as the coherence of codified institutions and effectual legal representations, often conflicting or alternative. These were very difficult for comprehension. This fact was directly manifested in number of normative decrees of emperors as well as innumerable acts¹⁰.

The most characteristic of Byzantine law is recognized the dominant role of religious principle¹¹. It was embodied in the acknowledged significance of canon law. To say the truth, Byzantine civil law constantly existed under the direct or indirect influence of religious and ethical norms of canon law. In terms of medieval jurisprudence, there is an important premise for the recognition the latter as an integral part of Byzantine law. This reason consists in the absence of the principal distinction between canon law and civil law¹². On the one hand the canons, unlike institutions of civil law, are considered as a form of rules that act on the ground of religious faith and creed. On the other - the civil law as well as customary law are reckoned the principal sources of ecclesiastical law¹³. At last it is necessary to emphasize that the Justinian legislation like Roman law codified in Digests and Institutions has not lost its importance for the church. Therefore many canon codes

⁴) For details see I.P. MEDVEDEV, *Legal Culture of Byzantine Empire* (in Russian: Медведев И.П. Правовая культура Византийской империи), St. Petersburg 2001. There also see the basic literature.

⁵) *History of Byzantium* (in Russian), Moscow, 1967, I, p. 253.

⁶) *Ibid.*, p. 35-37.

⁷) G.L. KURBATOV, *History of Byzantium (From the Antiquity to the Feudalism)* – in Russian: Курбатов Г.Л. История Византии (От античности к феодализму) –, Moscow, 1989, p. 216-240.

⁸) In «Justice et législation» (dir. A. PADOA-SCHIOPPA), Paris, 2000, p. 401-403.

⁹) *Culture of Byzantium – The first half of VIIth centuries* – (in Russian), Moscow, 1984, p. 368.

¹⁰) See: *Culture of Byzantium – The second half of VIIth-XIIth centuries* – (in Russian), Moscow, 1989 p. 216-240.

¹¹) AZARKIN, *The General History*, quot., p. 68.

¹²) A.S. PAVLOV, *Lectures on Ecclesiastic Law* (in Russian: Павлов А.С. Курс церковного права), St. Petersburg, 2002, p. 12.

¹³) *Ibid.*, p. 35-37.

include various extracts from the legislative corpus of this emperor¹⁴.

First of all the creativity of Byzantine legists was manifested itself in the intention to bring existing law into line with the contemporary concepts of reality. Thereby obsolete laws were to be revised or substituted with new decrees. They were verified not only through each other, but also by canons. The elimination of contradictions in them served needs of the moment¹⁵. At the same time the legists mostly compiled new legislative compendiums by means of the selections and excerpions from ancient codifications. In the end the early byzantine law in Latin was become very bulky and cumbersome. It was too knotty and full misunderstandings for the majority of the Greek population. There was a lot of contradictions in it, that complicated law above measure. It was officially permitted interlinear translations of terms from Latin to Greek as well as composition of indexes, in fact – translations of texts to Greek, and compilation of so-called paratitles, in other words – comparison of titles of Digest with different acts concerned the same subjects¹⁶. The juridical texts, newly composed in Greek, are the most important result of development of the analytical jurisprudence in its immediate sense in despite of numerous interpolations, constrictions, supplements and renovations. These texts usually abounded with the various notions and terms, borrowed in their Latin prototypes. As a rule, numerous transliterations were substituted not at once and not every time. Adequate Greek equivalents failed to be found for all remains of the Latin terminology. Therefore many Latin terms hardly translated often used in original language or Greek transcription¹⁷.

It is necessary to note that these phenomena are considered as the problem not only extremely complicated, but also far from its solution¹⁸. The compilation nature of Byzantine law prevented from authentic unification of the terminology, not to mention classification of wider conceptual and categorical relations and connections, that would be a vague image of the future legislative system¹⁹. For example, the general notion of property in medieval Byzantium, rooted into classical Roman law and the Justinian legislation, was comprehended in a correlation with theological concepts, that determined the historical and cultural context of the Byzantine epoch. The clear evidence of that fact is the proper terminology²⁰. Thus the question is not only recognition of the fundamental role of custom and customary law, functioned in the life and mentality of the Byzantine society as legislation norms²¹. The generalization of the social experience, conditioned by dominant political and law principles and theological ideas, had transformed into the formation of genuine terms pointed to the comprehension of complex social relations, processes and groups²².

Estimating new tendencies in the evolution of the terminology of Byzantine law, sometimes even prominent scientists solely follow their own intuition. If it is supported by a reliable scientific experience, student gets a good chance to transform empirical observations into the conceptual form, made on the brink of the scientific knowledge and the research sagacity. The conclusions, drawn by K.V. Hvostova, are such as example. They are concerned the idea of social changes represented by the Byzantines²³. In one of the latest articles scientist demonstrates not only the fact that the Byzantines clearly understood the role of information in studying their past. She also

¹⁴) PAVLOV, *Lectures on Ecclesiastic Law*, quot., p.47-48, 56-57 and so on.

¹⁵) K.V. HVOSTOVA, *Social and Economic Processes in Byzantium and the Comprehension of them by Contemporary Byzantines (XIVth-XVth centuries)* – in Russian: Хвостова К.В. Социально-экономические процессы в Византии и их понимание византийцами-современниками (XIV-XV вв.) –, Moscow, 1992, p. 5.

¹⁶) E.E. LIPSHITS, *Justice and Judgement in Byzantium in IVth-VIIIth centuries* (in Russian: Липшиц Е.Э. Право и суд в Византии в IV-VIII вв.), Leningrad, 1976, p. 95.

¹⁷) LIPSHITS, *op. cit.*, p. 111.

¹⁸) *Culture of Byzantium – The second half VIIth-XIIth centuries* –, quot., p. 228.

¹⁹) See: *Culture of Byzantium – The first half of XVth century* – (in Russian), Moscow, 1991, p. 307-308.

²⁰) HVOSTOVA, *op. cit.*, p. 22 and so on.

²¹) *Ibid.*, p. 24-25.

²²) HVOSTOVA, *Social and economical processes*, quot., p. 92-93.

²³) *Ibid.*, p. 125-126 and so on.

proves, quite convincingly, the existence of special techniques used to informational communication in Byzantium²⁴. In this light it is arisen the new problem of studying on the Byzantine law. Now the actual task in hand is to estimate the information potential of legal terminology and conceptual system reflected, as was said, both in Latin and Greek versions according to general tendencies of the formation of Byzantine legislation.

Throughout many centuries the desire of scientists to penetrate into secrets of legal thought of the past based mainly on the application of one available method that was the comparison of structure and content of various legislative codes. Keeping to the beaten track, the representatives of the comparative jurisprudence resorted mainly to the comparison of particular aspects of ancient and medieval legislation. Scientist of the past had never another way and could not have it for many reasons. First of all Byzantium had got the legislative heritage in so much volume that analysis of it required for enormous efforts. And they are made by the scientists of the erudite epoch. In last quarter of the past century Russian scientist E.E. Lipshits posed distinctly the promising task to study on the Byzantine law: the «complete research» of the text of Digest, the Code and Novels of Justinian and legislative monuments of later periods including the «Libri Basilici»²⁵. The Russian researcher regarded the systematical textological studies on the legislative codes and theirs compilations of the IXth-XIth centuries as general prospects of modern byzantinology. It ought not to put their realization off the future²⁶.

At present the science, informatics in particular, offers new methods of solution scientific tasks put for analysis of examined materials. It is a question of the database «Byzantine law», databank of notions and terminology as well as thesaurus of concepts and categories reflected the legal and religious consciousness of Byzantines. Unfortunately the authors of the project have not an opportunity to compare their program product and «Thesaurus Linguae Graecae» proved already for thirty years and other more recent information retrieval systems representing Byzantine sources in detail²⁷. First of all the matter will concern the principal characteristics of the database «Byzantine law» and corresponding plans. It is worth to mention here that their problems are predestined by the subject, in other words, by the pertinent branch of knowledge, that is studied on. The initial stage of creation of the database («Foundations of Byzantine legislation») is conditioned by the nature of law monuments that are involved in the project. The principal objects of research and information analysis are Digests, Code, Novels and Institutions of Justinian as well as the «Libri Basilicorum LX» with scholia to them. These monuments of Byzantine law have the greatest historical, legal and cultural comprehension and scientific importance, those are not required the detailed description in view of theirs notoriety. Perhaps, it is only item, that would be desirable to remind, concerns scholia to the «Libri Basilici». Mentioned scholia are so extensive by its size as much as their structure and history²⁸. Therefore, maybe, they are still poorly examined. At the same time scholia to the «Libri Basilici» serve as the bridge to cognition of general principles of formation of legal and religious representations of Byzantines those become directive attitudes of their social consciousness. It is the most significant scientific guidelines of the project those promote the reproduction of reciprocal connections of Byzantine law system in its completeness. They bring timely about the scientific actuality of the realization of the present project.

²⁴ EAD., *Problems of Social Information in the Medieval Society (on the Byzantine material)*, in «Problems of Historical Knowledge» (in Russian: Хвостова К.В. Проблемы социальной информации в средневековом обществе (на византийском материале)), in «Проблемы исторического познания», Moscow, 2002, p. 89 and so on.

²⁵ E.E. LIPSHITS, *Justice and judgement*, quot., p. 86-87.

²⁶ EAD., *Legislation and jurisprudence in Byzantium in IXth-XIth centuries* (in Russian: Аутиниц Е.Э. Законодательство и юриспруденция в Византии в IX-XI вв.), Leningrad, 1981, p. 5-6.

²⁷ T.F. BRUNNER, *The Thesaurus Linguae Graecae and Byzantine Literature*, in «XVIIIth International Congress of byzantine Studies. Plenary reports», Moscow, 1991, p. 337-346; C. GASTGEBER, *Text-Bild-Datenbanken in den Forschungsprojekten der Wiener Byzantinistik: Zwischenstand und Ausblick*, in «XXe Congrès international des études byzantines. Pré-actes: Séances Plénières», Paris, 2001, I, p. 378-379.

²⁸ *Culture of Byzantium – The second half VIIth-XIIth centuries* –, quot., p. 229.

Thus the Byzantine law database («DB») constructed in the Center «The Problems of Historical Knowledge» at the Institute of General History of RAS. with the participation of young specialists of «BMSTU» represents the multi-purpose system of storage and representation of the mixed Greek diacritic, Latin and Slavonic texts (*fig. 1*). The original database management system («DBMS») is specially destined to form automatically the data array has capabilities to insert arbitrary quantity of texts and to organize them as so-called electronic library. The «DBMS» is enable to apply a number of procedures (search, editing, system analysis) to the electronic versions of all legislative corpuses of Byzantine law listed above and to keep on the system support to them with the aid of auxiliary apparatus. It is represented by so-called annotations. They are designated to reflect the structure of the information search array and associations of its individual parts, notes to legislative monuments stored in «DB» and its lexicons — lists of all available word-forms with the indication of the frequency of its usage.

As whole «DB», including now 37888 units of total capacity 130 Mb, contains 113000 records word-forms and auxiliary signs. They represent the formatted and structured electronic versions of Justinian' Digests, Codex and following Byzantine law. The foundation of «DB» consists of the largest legislative corpus of medieval Byzantium, so-called «Librorum Basilicorum LX» (second half of IX - beginning of X centuries). Thus the «DB» contains 60 books of them, that is more than 620 titles of the said legislative monument, those consist of 13693 units in total, and besides more than 5000 scholia in them. The Lexicon of the «Librorum Basilicorum LX» is compiled by 46215 word-forms and service signs. The auxiliary system of «DB» points out the associations of individual parts of the «Librorum Basilicorum LX» to Digests, Codex, Novels and Institutions of Justinian, Novels of Leo the Wise, Proheiron and so-called the Rhodos Law. The most of the «Libri Basilici»' parts is briefly annotated with the indication of assumed authors' names of prototypes, which are borrowed from Digests. The list consists of 30 names:

Alfenus (Alfinus) Varus	Marcellianus
Africanus	Modestinus
Arcadius (Charisiua)	Neratius (Νερέτιος or Νεκτάριος)
Callistratus	Papinianus (Papianus, Παπιανός)
Claudius Saturninus	Papirius Iustus
Florentinus	Paulus
Furius Anthianus	Pomponius
Gaius	Proculus
Hermogeniaanus (Hermogenus, Fromogenus)	Scaevola (Scaeuola, Scaebola)
Iavolenus (Iabolenus, Ιαβολένος, Ιαβολιάνος)	Terentius Clemens
Iulianus (Ιουλιάνος)	Tryphoninus
Labeo	Ulpianus
Licinnius (Licinius) Rufinus	Valens (Valentinus)
Marcellus	Venuleius (Hanulus)

Texts of notes, compiled by experts of Center, also represent some specifications to controversial attributions of the parts of the «Librorum Basilicorum LX».

The electronic version of the «Librorum Basilicorum LX» and other monuments of Byzantine law those are inserted in «DB» were built through scanning and the original method of the optical recognition developed by the authors of the project. This method is designed for translation the texts written on mixed Greek diacritical, Latin and Old Slavonic alphabets into a machine-recognizable form. The doubtless success of the authors of the «DB» «Byzantine law» is concluded in the automation of the process of its formation (*fig. 2*). Text of each monument stored or will be inserted into «DB» represents the complex of individual volumes, whereas annotations and the Lexicon has correspondingly a form of indivisible structure associated reciprocally and uniquely with a concrete

source. The description of the structure of texts stored in the «DB» is used as the catalogue of the electronic library. It is built as the treelike-structure. At its top level are arranged the titles of sources stored in the «DB», then they are followed by hierarchy of parts peculiar to each monument. So the hierarchy of the «Librorum Basilicorum LX» has the chain-like structure: source - book - title - part. The index of each part reproduces this hierarchy, for example «B.A.I.01.009». The letters in its beginning «B.A.» designate the code of the source, next Roman figure «I» corresponds to the number of the book. Arabian figures «01» are the code of the first title, and last three figures «009» represent the number of part or article of the legislative monument. Sometimes such-and-such index is also added by subsidiary figures or letters combinations indicated an internal structure of corresponding part. The full index of a part formed like this is served as the principal means of the retrieval of any required fragment of text. As to the system of notes it provides for texts of sources with the comments of any format. The special file of so-called Lexicon is meant for automatic replenishment of the information on all word-forms, otherwise grammatical forms of words, those are applied to the text of source. An information about service marks, numbers and designations of lacunas are represented likewise. Each word-form inserted in the Lexicon is reproduced in an original form through symbols of the appropriate alphabet. The designation of word-form is accompanied with the indication of frequency of its usage in text and the special code based on proceeding of Lexicon.

At present time the «DBMS» supports the functions of the system access to the data array, the information searches and auxiliary operations including texts and applications editing, equally automated insertion of new sources into the «DB». The mentioned procedures are realized by user through the reference to system commands of the «DBMS» *Structure and contents*, *Annotations*, *Lexicon*. The regime «*Structure and contents*» is meant for consecutive examination of particular text by any books and parts of Law monuments. The regime «*Annotations*» is served to represent the texts through information required by user, that is their headings and connections to prototypes, names of antique lawyers, authors of prototypes of borrowed texts and notes to the parts and clauses of law monuments. The regime «*Lexicon*» opens the access for user to the Frequency Lexicon contained the full list of lexical elements of the each text.

Thus, the database information can be given to a user as one of the two variants:

1. Electronic book embracing the full text of a monument;
2. Annotations.

First of all a user may require the full text of a monument formed as the electronic book ([fig. 3](#)). The electronic book consists of the indexed parts and description of theirs allocations in the database hierarchy. So the index «B.A.VII.06.010» points out the tenth part of the VIth title of the VIIth book of the «Basilicorum Libri LX» ([fig. 4](#)). As it is mentioned for the processing of database information there are the provided functions of search, editing, printing and the set of navigating functions.

The search function has the aim at the prompt jump to the required part of a source. This function is realized by the «DBMS» through double regime: the simple and the expanded. The first one functions as the search on each entry of the specified substring in any part of the text. At the same time the search can be made both within a particular source, and in contents of all sources of the database. The user has opportunity to choose the required word-form in the Lexicon and to carry consecutively out the search of each inclusion of this word-form in source. It is necessary to note that the system supports the search of both Greek and Latin words ([fig. 5](#)). It is the doubtless success of the working-out algorithm that is option of the search of not particular words only but also of word collocations. The authors managed to achieve high retrieval rate with the help of the specially designed information structure. Thus it takes 20-30 seconds for the complete look-up on the full text of the «Librorum Basilicorum LX».

The expanded regime of the word search is worked out as retrieval system for different

grammatical forms of required word or combination of different required words. This system supports the alternative word search taking into account the register of required words, their grammatical forms and diacritics. If the retrieval in the expanded regime is carried out without the formal match criterions, there is certainly a little noise of the search results. It is conditioned by morphological similarity and partly coincidences of word-forms in the differ constellations of the related keywords. But the good relevance is guaranteed by the right choose of the options in the expanded regime of the retrieval system. Its seek time is about 2 minutes for the complete look-up on the full text of the «*Librorum Basilicorum LX*» ([fig. 5a](#) - [fig. 5b](#)).

The editing functions provide user with the means of operations on Greek, Latin and mixed-languages texts. The text amendments in Greek are entered at the main editing window. It is designed the special window to input the Latin insertions in Greek text ([fig. 6](#)). The text come through the editing procedure is formatted as mixed ones. But the same algorithm is applied for the text processing regardless of the language of the text (Greek or Latin) and the usage of the proper or the mixed alphabet ([fig. 7](#)). Database navigation functions make provisions of the transition to the next or previous part, transition to the next hierarchy layer, transition to annotations of an active part.

The annotation structure being developed by research assistants of the Center is the main means of the database search. The annotation is individually worked for each title. Every annotation consists of the index of a title, its text on the language of the original and the list of all parts of a title. For each part are indicated his index, the list of relations of the part to the corresponding parts of other sources and the text of the note to current part. Thus the annotations represent the structure of relations between different sources stored in the database. The organization of this information in the annotations gives to user opportunity to search the required parts of any source. The search operation is carried not through the contents of a part, but through the annotations structure. This mode makes premise to trace associations between the corresponding parts and to jump promptly to correlated parts of another monuments. The annotations are represented for the user as the individual window «*Annotations*» ([fig. 8](#)).

It is provided functions of search, editing and print for operations with annotations. The editing function works on the insertion of corrections and additions into the array of annotations. It is permitted to edit both the whole annotation and its parts. Addition, change and deletion operations are carried for each element ([fig. 9](#) and [fig. 10](#)). The operation of deletion the full information on any part from the annotation structure does not touch on the text of this part of a source that will not removed from the *dB*.

The search of the requested information can be made in each field of the annotation structure including the index of the title, its text, the list of the parts of the title, associations of the sought part and the notes to it. The query substring is specified on Greek, Latin or Russian depending on the field of the search and the requested information. The results of the search are the list of indexes of the annotations or the list of indexes of partitions whose information matches the specified search criteria. For example, one can carry out the search of partitions of «*Libri Basilici*», the notes to those contain the mentions of Digests ([fig. 11](#)). The results of this search are represented at the individual window ([fig. 12](#)). Here it is simultaneously looked through the full text of an annotation contained the requested part.

Inasmuch as annotations are designed for the alternate search of source' parts, the developed system of annotations is provided for look-up of the full text of any source' part and direct jump to the corresponding fragment of any original source, in other words to the certain page of the electronic book.

As was mentioned the «*DBMS*» supports some auxiliary functions as the representation of the content of the Lexicon and printing of its fragments liable to examination. The window «*List of words*» is used for operations with the Lexicon or frequency dictionary ([fig. 13](#)). There is the combo box on the top of window to choose the title of the request source. The text field of entry of the request is located lower. And then – the field displaying a number of the word-form repetitions in

any source. Then there is situated the list of the all word-forms revealed in the text of specified source. The current word, having been selected, become the object of copying, replacement by the other word-form and may be deleted.

The window «Print» maintains the function of printing and to preservation the Lexicon as a file after preliminary viewing ([fig. 14](#)). This window makes it possible to choose a source and printing modes:

1. Printing of words of the specified range
2. Printing of all words beginning with specified letter of the alphabet.

So it is analogous saved the dictionary in form of file.

Accomplishing the description of the structure and functions of the «DBMS» it is necessary to emphasize that the decision of practical tasks of usage of the data is not the only purpose of the participants of the project. They put forward problems of scientific character. Therefore the design of the Byzantine law database is considered as the initial stage of the realization of research plan. It is possible to point out the principal directions of the further development of the *dB*. They conditioned by insertion of new sources into *dB* and by enlargement of the electronic library as well as the systematization in the manner once foresighted by E.E. Lipshits. Thus it is planned the improvement of the search system and capacity of information warehouse to develop the automatized data processing system of the linkage of sections. Now the *dB* is already used for compile the data of the databank of authentic notions and terms and the bases of knowledge of conceptual-categorical apparatus of Byzantine sources. At the same time it is realized the work at the methods of computerizing analysis of sources aimed at the building of the thesaurus of conceptual-categorical apparatus of Byzantine sources.

It is provided for the task of insertion new sources in the *dB* to translate them from the traditional form into electronic one and to build subsequently the *dB* structure. Now the principal parts of the Justinian' legislation, the «*Librorum Basilicorum LX*» and scholia to them are already inserted in information array of the DB. In the near future, as it is planned, the *dB* will be added by the original versions of Justinian' Novels including «*Authentica*» and also Novels of Leo, Synopses to «*Basilicas*», «*Tipukeitos*», «*Eclogue*», «*Procheiron*», «*Hexabiblon*» of Constantine Armenopol and other monuments of Byzantine law, among which it is necessary to mention «*Peira*». Then input work queue will be waited for the most important corpuses of canon law, including «*Syntagma of the Saint Canons*» and «*Alphabetic Syntagma*» of Matthias Vlastar. So, with the accordance of understanding of the nature of Byzantine law, the contents of the *dB* will be consisted of four parts:

1. *Ius civile*
2. *Ius canonicum*
3. *Iurisprudentia & Iustitia*
4. Slavonic receptions

Another perspective direction is the computerizing of the search process and systematization of identical fragments, stored in information array of the database, or fragments tracing to one prototype. It is supposed to find the solution of this problem by arrangement of data set on the purposeful establishment of correlation between different parts of various sources. In this connection it will be very useful to compile the concordance of proper names and toponymy as well as the chronological digest. The both latter tasks are planned to accomplish through the construction of retrieval systems in this year.

The usage of data of the *dB* «Byzantine Law» has the most prospects for the design of the databank of authentic notions and terms of Byzantine sources and its conceptual-categorical appa-

tus' knowledge bank²⁹. These data systems are rated as the first phase of the development of the thesaurus and finally the expert system with the object of conceptual-categorical picture of the Byzantine sources. The success of an implementation of these plans depends greatly on the development and realization of the methods of computerized analysis³⁰.

The problem of the working out the conceptual-categorical thesaurus of the Byzantine sources is submitted in outline by the conceptual project³¹. Therefore it is enough to mention here about the development of the flexible structure of data capable to reflect adequately relations between notions and terms in the text of the examined source. This problem has the special importance for realization of future plan of the *dB* workgroup. Today its participants preoccupy on the designing and engineering the system of computerized analysis of the conceptual-terminological and categorical apparatus of sources inserted into the *dB*³².

As it was noted the first task on the way of the development of the thesaurus and the system of machine analysis of Byzantine sources is contained in the creation of the databank of notions and terminology. In the complete accordance with this intention it is put forward the studying of lexicon of Byzantine law and legislation. The principal aspect of the *dB* operation must be recognized the treatment of the whole volume of the vocabulary represented by the full-text documents that are inserted in the data array. But the main feature of the designing databank is perhaps concerned to word collocations that possess a complete logical sense. In such a way program system will allow to analyze the notions and terms on the grounds of the specified criteria those are resulted from the gained experience of studying on the texts of Byzantine legislative sources. The further steps are proposed to do in the direction of composition of lexical matrix. Its role is concluded in the systematization of notions and terms by the registration of their valencies and meanings³³.

As the basis for solution of the set tasks are used the models of the Block of Notions and terms as special information retrieval system («BNT»), built by D. Kondratjev, and the Module of Determination of the Information Affinity of texts («MDIA»). The main function of the «BNT» is the systematization of the authentic notions and terms of the Byzantine law texts (*fig. 14a* - *fig. 14b*). The «BNT» also will be the principal systems, owing to whose data a user will be able to find the fragment or fragments of an original document contained the quest notions and terms. At the same time selected fragments may be used for building functionally focused the knowledge bases. So the «BNT» certainly will play the most important role as a functional unit of branch search and analysis of texts.

The rough version of the «MDIA» is based on the algorithm of the comparison of contexts of historical sources that was designed by the members of our Project as the main part of the con-

²⁹ T.A. GAVRILOVA, V.F. HOROSHEVSKIJ, *Knowledge Bank of Intellectual Systems* (in Russian: *Базы знаний интеллектуальных систем*), St. Petersburg, 2001.

³⁰ The information on problems of examination of conceptual-categorical apparatus in connection with building of the databank and thesaurus see in: S.V. GRINEV, *Principles of terminologic* (in Russian: *Введение в терминоведение*), Moscow, 1993, p. 267-280.

³¹ Ju.Ja.VIN, A.Y. GRIDNEVA, *Thesaurus of Conceptual and Categorical Apparatus of Byzantine Sources: Legal and Religious Aspect. Conceptual Project*, in «Problems of historical knowledge» (in Russian: *Тезаурус понятийно-категориального аппарата византийских источников: правовой и религиозный аспекты. Концептуальный проект*, in «Проблемы исторического познания»), Moscow, 2002, p. 141-196.

³² In details see: Ju.Ja.VIN, A.Y. GRIDNEVA, *The Law Heritage of Byzantium and New Perspectives of its Information Study: The Database «Byzantine Law»*, in «Vyzantijskij Vremennik» (in Russian: *Правовое наследие Византии и новые перспективы его информационного исследования: База данных «Византийское право»*, in «Византийский временник»), Moscow, 2004, t. LXIII, (88), p. 206-225. Also see: Ju.Ja.VIN, A.Y. GRIDNEVA, *The Database «Byzantine Law»: The Results and The Perspectives*, in «Circle of the Ideas: The Electronic Resources of Historical Informatics» (in Russian: *База данных «Византийское право»: итоги и перспективы*, in «Круг идей: электронные ресурсы исторической информатики»), Moscow, 2003, p. 134-157.

³³ See: Ju.Ja.VIN, *From the conception to HT: The Interdisciplinary Aspect of historical Study on the Notions and Terms of Byzantine Sources*, in «Interdisciplinary Approaches to Studies on Past: Before and After 'Postmodern'» (in Russian: *От концепции к выской технологии: (Междисциплинарный аспект исторического исследования понятий и терминов византийских источников)*, in «Междисциплинарные подходы к изучению прошлого: до и после 'Постмодерна'»), Moscow, 2005, p. 96-98.

ception of the semantic field are formed by the notions and terms. It is assumed on the revelation of an information affinity of compared contexts through the quantitative valuation of the data on the juxtaposing of the notions and terms by statistical methods³⁴. A user examining the text of source has the means by help of the «MDIA» to form and insert corrections into the structure of notions and terms of the analyzed text (fig. 15) and to reveal logical and grammatical functions of individual word-form of key words by its indexing (fig. 16). The analysis of text through the module is immediately started by the revelation logical and syntactic relations (subject - predicate - object) of authentic notions and terms in the text (fig. 17). Then, according to chief the designation of the module, it is making the calculations of the parameters of so-called «Approximate» affinity (fig. 18) and «Real» affinity (fig. 19) of analyzing fragments of a text. In other words the matter in question is determination of the correlation of the selected in the texts individual word-forms, key words and notions.

At the same time the efforts of the authors of the project are made on the logical and grammatical systematization of key words and notions of texts of Byzantine Law to comprehend the general principles of formation and functioning of authentic notions and terms. The objective of this investigation is that the adequate interpretation of their social and idiomatic contents, the revelation of semantics and the modality of the considering phraseology that reflects mental intentions and implicitly manifested constructs of the consciousness³⁵.

As the most perspective issue on the agenda is the deduction on notion' and terminological parallels in the texts written in various, first of all Latin, Greek and Old Slavonic languages. The results of this procedure will be presented in form of lexical – notion-terminological matrix, the design of that lies ahead. Within the framework of project of the Byzantine law database such reconstructions will become the starting point on the way of the epistemological acknowledge. It concerns not only the fact that the ascertainment of terminological and, that is more important, conceptual and categorical parallels in any texts written in various languages is required the certain historical-lawful and in some scientific situations philosophical-cultural basis. From this standpoint it is important that the analysis of terms and notions will go beyond unsystematic observations on elementary empirical data in the direction of the usage of developed texture enabling the revelation of complicated figures of thought and mental structures. Thus it will afford the ground for the reconstruction of the semantic field of any source input into the *dB* irrespective of the language of an original to compare the pass of a specified semantics of prototypes to theirs translation versions.

The creation of the system of computerized analysis of texts as it is described above will be undoubtedly applied by issue of a day that will be solved in the near future. However the accumulation of data for it is already begun by the authors of this project. At the same time it is initiated the development of the so-called semantic networks that will become foundations of intellectual

³⁴) Ju. Ja. VIN, A. Y. GRIDNEVA, D. E. KONDRATJEV, O. V. TИHONOVA, *The Conception of the Semantic Field of Historical Sources: The Project of Information Investigation*, in «Dialogue with Time: The Intellectual History Review» (in Russian: *Концепция семантического поля исторического источника: проект информационного исследования*, in «Диалог со временем: Альманах интеллектуальной истории») Moscow, 2004, p. 84-99; D. E. KONDRATJEV, O. V. TИHONOVA, *Algorithm of Comparison of Clauses on the Basis of Semantic Affinity of Notions*, in «New Information Technologies (Acts of the conference. MSTU)» (in Russian: *Алгоритм сравнения предложений на основе семантической близости понятий*, in «Новые информационные технологии - Материалы конференции МПТУ им. Н.Э. Баумана»), Moscow, 2003; ID., *The Algorithm of the Determination of an Information Affinity of the Historical Sources on the Basis of Statistic Analysis of the Notions and Terms*, in «Role of the Information in the Formation and Development of Socium in Historical Past» (in Russian: *Алгоритм определения информационной близости исторических источников на основе статистического анализа понятий и терминов*, in «Роль информации в формировании и развитии социума в историческом прошлом»), Moscow, 2004, p. 78-82.

³⁵) Ju. Ja. VIN, *Seeking for New Methods of Investigation of Social Information of Concepts and Terms in Byzantine sources: Primary Notes*, in «Role of the Information in the Formation and Development of Socium in Historical Past» (in Russian: *В поисках новых методов изучения социальной информации понятий и терминов византийских источников: Первичные наблюдения*, in «Роль информации в формировании и развитии социума в историческом прошлом»), Moscow, 2004, p.116-146.

systems, such as the thesaurus and the expert system. The authors of the database «Byzantine Law» are sure that these systems gaining the important scientific and practical significance will be applied in many areas of the byzantinology.

Figures

High Definition	Low Definition	
1.	1.	Database main window
2.	2.	Automated data input
3.	3.	Window «Structure and contents»
4.	4.	Section hierarchy
5.	5.	Search in Database
5a.	5a.	The expanded regime of the word search
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8.	8.	Window «Annotations»
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