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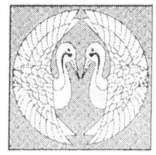

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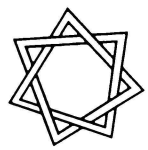

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ORIENTAL MANUSCRIPTS AND NEW INFORMATION TECHNOLOGIES

V. A. Jakobson

ASSYRIOLOGICAL DATABASE (BASIC REQUIREMENTS)

In my previous articles [1], methods of creating a computerised card-index or, more accurately, a group of interlinked card-indexes on the history of cuneiform law were discussed. The notion of a concept as a semantic unit which allows one to create formal descriptions of legal texts in natural language was in particular formulated. Such semantic units are always interconnected, forming a "tree" or "matryoshka" of concepts. In other words, the semantic field of virtually any concept can be divided into a certain number of levels, each of which is an independent concept. On the other hand, almost every concept can be viewed as a level of the semantic field of a larger concept. With the aid of a computer, all levels can be investigated in consecutive order ("matryoshka") and depicted graphically (the "tree"). This allows one to discover links between concepts which are far from obvious and sometimes even unexpected.

Such a "conceptual" approach to the text has often permitted researchers to introduce important clarifications even without the use of a computer. Some examples of interpreting the Laws of Hammurabi with the aid of this methodology were cited in the previous article [2]. Here we give an example of how this methodology allows one to understand correctly the very structure of those Laws. Let us turn to the text now:

§6. If a man has stolen the property of a god or the palace, this person must be killed, and he who accepted the stolen (goods) from him must be killed.

§7. If a man has bought or accepted for storage without witnesses or a contract silver or gold, or a slave, or a slave-girl, or a bull, or a ram, or an ass, or anything else from the son of a man or the slave of a man, he is a thief [and] must be killed.

§8. If a man has stolen a bull or a lamb, or an ass, or a pig, or a boat, (then) if (this) belongs to the palace, he must return it thirty-fold; if (this) belongs to a *mushkenum*, he must return it ten-fold; if the thief has nothing with which to repay [this], he must be killed.

§8 is clearly a continuation and clarification of **§6**. The difference between them is that **§6** deals with theft from a temple or palace, which is sacrilege, whereas **§8** concerns the theft of ordinary property, hence, different punishments are imposed — the death penalty in the first case, and manifold compensation of the damage caused in the second (the death penalty is incurred here only if the guilty party is insolvent). This makes many researchers believe that **§7** was erroneously placed between **§6** and **§8**, and should in fact come after **§8** (in fact, we speak here of parts of a single text which lacks numeration in the original). But the logic of this text differs somewhat from ours. Individual statutes ("paragraphs") follow one another in associative fashion; moreover, the group of statutes is united by a general idea ("concept"): protecting the property of temples, the ruler, and free men. **§7** follows **§6** because they are united by the illegal "reception" of someone else's property, while **§8** follows **§7** because they are united by the nearly identical enumeration of illegally acquired objects.

From the point of view of modern legal theory, **§7** should be set apart, as it formulates in casuistic fashion one of the basic concepts (categories) of legal theory — the concept of capability. The basic categories of law were clearly formulated first in Roman law. Babylonian legal scholars, too, sensed the need for such categories, but were unable to express them in abstract form. Hence, they formulated some of them in casuistic form, such as the ban on buying or otherwise acquiring any property from a "son of man" or "slave of a man", that is, persons subject to patriarchal rule. Not fully cognisant of the significance of their "find", these legal scholars failed to include point **§7** among the opening paragraphs of the Laws of Hammurabi, which determine (also in casuistic form!) the basic principles of dispensing justice, in essence, the basic principles of law. In addition, the concept of "thief" here (and in a number of other paragraphs) is significantly broader than in modern law and is closer to "criminal" or "miscreant" as understood in old Russian law.

A conceptual model of text **§6** is given in a special article by a group of authors [3], which formulates the rules for recording conceptual models. We provide below models for **§7** and **§8**.

Law 7

```
**change_of_ownership: !X(transmitter.!X1,
   acceptor.!X2, property!Y, formalities.!Z)
⇐
```

```
purchase_sale:  !X  (seller.!X1,
  buyer.!X2, property.!Y,
  formalities.!Z)
OR
for_storage:  !X  (transmitter.!X1,
  acceptor.!X2, property.!Y,
  formalities.!Z);
** man: !X (leg_status.insolvent)
⇐
man: !X (age.minor)
OR
man: !X (status.slave);
paragraph [num.7] {change_of_ownership
  [formalities.not_observed,    transmittor.
  man [leg_status.insolvent]]
  (acceptor)
"incurs"
  execution (condemned.acceptor)};
```

Law 8

```
paragraph [num.8] {theft [object_of_theft.
  priveleged (value)]
  (thief [prop_status.solvent])
"incurs"
compensation (payer.thief,
  amount.30* value);
theft [object_of_theft.
  priveleged (value)]
  (thief [prop_status.insolvent])
"incurs"
execution (condemned.thief);
theft [object_of_theft.
  property [owner.mushkenum]]
  (thief [prop_status.solvent])
"incurs"
compensation (payer.thief,
  amount.10* value);
theft [object_of_theft.
  property [owner.mushkenum]]
  (thief [prop_status.insolvent])
"incurs"
execution (condemned.thief)};
```

The **MAZE** system created today allows one to construct a laboratory conceptual model and to project ways of employing it. Let us examine this with a concrete example relating to the above-noted paragraphs from the Laws of Hammurabi (copy and transliteration are omitted both because of space considerations, and because their inclusion is a trivial matter).

TCL 11, 245[1]

(1) As concerns the garments and head-dress
which were worn by the goddess Ninmarki and
(which) were torn off (from her),
the priests *pashishu*, the *rabianum* and the city elders
(5) in the courtyard of Ninmarki's abode
gathered. Said divinity exited (the temple) and
Ilama-abi, son of Nidnusha,
announced thus, saying this:
"These garments,
(10) which are in the hands of Iddin-Ishtar, are what was from Ninmarki
torn off.
Idin-Ishtar truly removed (them)".
Ili-iddinam thus announced, saying this:
"The head-dress from the head of Ninmarki
(15) Iddin-Ishtar truly gave over for dates".
Tashalisha, son of Aplum
thus announced, saying this:
"The head-dress and garments [...]
Iddin-Ishtar truly took".
(20) Ibni-Amurru
thus announced, saying this:
"From the lips of Erra-i[mitti?],
brother of Iddin-Ishtar,
I did thus truly hear, this is what he said:
(25) "The garments [...]
in which Iddin-Ishtar is dressed,
are that which was from the body of Ninmarki
torn off".
At a gathering of *pashishu*
(30) *rabianum* and city elders,
Iddin-Ishtar, son of Etel-pi-Sin,
in (the fact that) the garments and head-dress
which (were) on the body of Ninmarki,
(34) were torn off (by) him, was under oath exposed.

The conceptual model of this text and rules which establish correspondences between this text and the laws of Hammurabi are given in the article by Lezin, Boyarsky, Kanevsky and Popova [3]. What is more, the juxtaposition of this text with others (by using a thesaurus) can lead us to a number of interesting and important considerations:

a) From texts which mention the goddess Ninmarki, it is clear that her temple was a common location for court hearings. That is, Iddin-Ishtar robbed the very goddess in whose "presence" he was compelled to answer for what he had done.

b) The fact that the thief sold the goddess' head-dress for dates and donned the garments himself indicates that both objects were of minor value and hardly attention-grabbing items, meaning that this Ninmarki's temple was small and poor.

c) In Babylonia, dates were not a delicacy, but ordinary food. The thief, then, was a hungry man, nearly destitute.

d) The *rabianium* (city ruler) frequently presides over judicial proceedings, and the city elders are members of the court, but the *pashishu* priests are rarely mentioned as participants in the court. Perhaps they were priests of the victimized goddess.

[1] In Assyriological studies, it is accepted practice when transliterating and translating texts to put in parentheses words inserted by the translator for clarity but absent in the original; lacunae which result from damage are in brackets, where either dots mark the number of lost signs or a reconstruction is included, marked in case of doubt with a question mark (cf. line 22).

e) None of these people is referred to in our text as a judge. It is possible that this gathering was only charged with receiving testimony under oath from witnesses.

f) Court documents virtually never indicate a decision, limiting themselves to facts established in some fashion or other.

g) Court documents never refer to the law, but such references occur in letters.

All of these conclusions can be reached only on the basis of a significant number of texts. Clearly, increasing the number of texts analysed can augment or alter these conclusions. A thesaurus which not only takes into account words, but also their context within a phrase and source, would allow one to review texts automatically.

Consequently, all words from our text should be entered into the database, and also:

a) museum number (here omitted), bibliographic indications (in addition to those given here, data for all other editions), date (here established on the basis of circumstantial factors: in accordance with the text's origin and the names of the people involved), origin (archaeological data or circumstantial data from the text itself);

b) correspondence with other texts (see here the Laws of Hammurabi, §6);

c) official positions;

d) list of persons involved with an indication of genealogical links: X brother of Y, Y son of Z; the same persons may be mentioned in other texts with other kinship ties, for example, Z son of M or Y father of N, from which we learn that M is the grandfather of Y, and X is the uncle of N, etc., creating a genealogical tree;

e) description of content: criminal trial, record of witnesses' testimony;

f) procedure (lines 4—6), etc.;

g) key (thematic) words (concepts).

In sum, the database should permit the isolation, for example, of all criminal trials, all texts which mention a certain person, all texts which discuss theft, all texts which mention a certain official position, etc. The database should also ensure the possibility of performing certain logical operations [4].

It is evident that our modern concepts differ considerably from those of the Babylonians and have no direct analogies with them. In this connection, the problem of correct translation arises; it is especially important when the matter concerns translations from dead languages. Certainly, each such translation is an interpretation, and the degree of its accuracy depends on the fullest possible consideration of all known instances of word use, their forms and combinations. This is why scholars of ancient languages strive to create dictionaries which provide a maximum (ideally, a complete) number of examples for each word. However, the ideal is unattainable, if only because the number of cuneiform texts grows by several thousand each year. The fullest dictionary of Akkadian (Babylonian-Assyrian), the Chicago Assyrian Dictionary, remains unfinished, although it already includes about 30 volumes the size of the British Encyclopaedia (but much more expensive because of a limited print run and the difficulties of type-setting by hand). And yet it will never be finished: after the appearance of the last volume (approximately 10 more volumes are planned), it will immediately be necessary to begin work on publishing a series of additions, corrections, and clarifications. This last task is by definition infinite, the results hardly being convenient to use. This is why it is imperative to create virtual dictionaries of Akkadian and Sumerian, as well as other cuneiform languages. Expanding such dictionaries, and correcting them, would be extremely simple. For this purpose, it would be necessary to store the virtual dictionary on a single server with Internet access. The inclusion of corrections or additions to the basic material should be effected by a special international commission, but every researcher should have the right and the possibility to make, so to speak, "marginal notes" to the dictionary, as he does in the margins of his own real dictionary. In this case, the inherent incompleteness of the thesaurus is transformed from a drawback into an asset.

Such a server should include:

a) a full catalogue of all known texts (published and unpublished) with an indication of origins, museum number, description of contents, all relevant bibliographic data, and all intertextual links;

b) reproductions of all originals in the form of hand copies, photographs, or holograms;

c) all extant translations of the texts;

d) lists of proper names with an indication of exact or proposed links, official positions, dwelling places, dates (genealogical links should be established automatically and automatically adjusted to take new data into account);

e) list of toponyms with an indication of their geographical location and dating;

f) list of deity names with an indication of dating and an attendant list of temples;

g) list of official positions and titles.

Lists d—g should in all cases contain exhaustive references to texts. Also necessary are dictionaries to translate into Akkadian (Babylonian-Assyrian), as well as lists of key words which would allow researchers to locate on the server texts or excerpts of interest to them.

Since we speak here of an international database, the question of a working language is of no less importance. It is, in essence, predetermined by the fact that the Chicago Assyrian Dictionary uses English as a working language. The solution, seems to be not ideal since English grammar depends on fixed word order and in many cases precludes a line-by-line translation of the original. A line-by-line translation is far easier to compare to the original. In this sense, Russian is far more flexible and in the vast majority of cases permits not only a line-by-line translation, but also the preservation of word order in the original. The use of Russian as a working language would greatly simplify the development of programmes, but the idea is regrettably too hard to be implemented. In the modelling programmes, for the reasons noted above, we base our research on Russian.

Direct access (passive and active) to this international, virtual database will allow all specialists to take part personally in creating and perfecting this source. The first step in this project should be the consensus-based formulation of the technical tasks to be tackled in the creation of this database.

Notes

1. See V. A. Iakobson, "Komp'iuternaia assiriologiia" ("Computer Assyriology"), *Informatsionnye tekhnologii v gumanitarnykh i obshchestvennykh naukakh*, fasc. 3 (St. Petersburg, 1996), pp. 3—9. For the English version of this article see V. A. Jakobson, "Computer Assyriology", *Manuscripta Orientalia*, IV/4 (1998), pp. 55—9. See also *idem*, "Komp'iuternaia assiriologiia. II" ("Computer Assyriology. II"), *Informatsionnye tekhnologii v gumanitarnykh i obshchestvennykh naukakh*, fasc. 6 (St. Petersburg, 1997), pp. 10—5.

2. See *idem*, "Computer Assyriology", *Manuscripta Orientalia*, IV/4 (1998), pp. 55—9.

3. G. Lezin, K. Boyarsky, E. Kanevsky, A. Popova, "Programming of texts conceptual treatment", *Manuscripta Orientalia* III/2 (1997), pp. 42—8.

4. For more detail, see Iakobson, "Komp'iuternaia assiriologiia. II", pp. 10—5.