

《論 文》

Morphological, Anatomical and Statistical Analyses on The Four Ancient Mesopotamian Law Codes Including The Hammurabi Law Code:

—— Part VI Agricultural law, and law of retaliation ——

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VI -1 Introduction

In the previous sections the five comprehensive analyses were performed
for the four ancient Mesopotamian laws on the following topics :

Part I Survey of Size, Contents, and Transfer¹.

Part II Social Class and Development of Professions².

Part III Legal Litigation, Penal Law Code, and Civil Law Code³.

Part IV Written Contents and Commercial Laws⁴.

Part V Analysis on the fundamental data base of prehistoric
Mesopotamian sites⁵.

In this paper, as Part VI of this study, agricultural law and law of retaliation are analyzed

Agriculture is the most important industry in the ancient Mesopotamia where the canal-irrigation farming is well known. How, when and where had the above farming been developed are not yet very clear. In the Part V some eighty sites are analyzed in detail and progress of agriculture was discussed to understand accurately the real history of progress of agriculture and human lives. In this paper, an attempt will be made to disclose light and shadow of the canal-irrigation agriculture at the period of its maturity by materializing its relish. Legal involvement in this first industry in the Old Babylonians dynasty also will be discussed.

In the second section of this paper the law of retaliation will be discussed in detail in the four ancient law codes (UN, LI, E and H laws), in particular on the following topics.

- (1) Was the Hammurabi law code the retaliation law?
- (2) The retaliation law transmitted from the H law to the Old Testament.
- (3) Is the law code of retaliation (lex talionis) cruel?

VI -2 Methodology

We employ as the primary materials the legible articles translated, literally from Sumerian or Akkadian to Japanese in Iijima's work⁶, from Lipit-Ishtar (LI)⁷, Eshnunna(E)⁸. and Hammurabi(H)⁹ law codes. In addition, the articles of the Ur-Nammu (UN), translated by Kobayashi¹⁰ from Sumerian to Japanese sentences are also used.

If needed, the following references are quoted^{11~44}.

VI -3 Agricultural law

3.1. Characteristics of Ancient Mesopotamian Agriculture :
Irrigation based on Canal system

3.1.1 Irrigation

(A) Transition of the dry-farming, rain-fed agriculture to canal-based irrigation ; The most probable path

Fig. V -1 Illustrates the transition of the dry-farming, rain-fed agriculture to the canal-based irrigation agriculture.

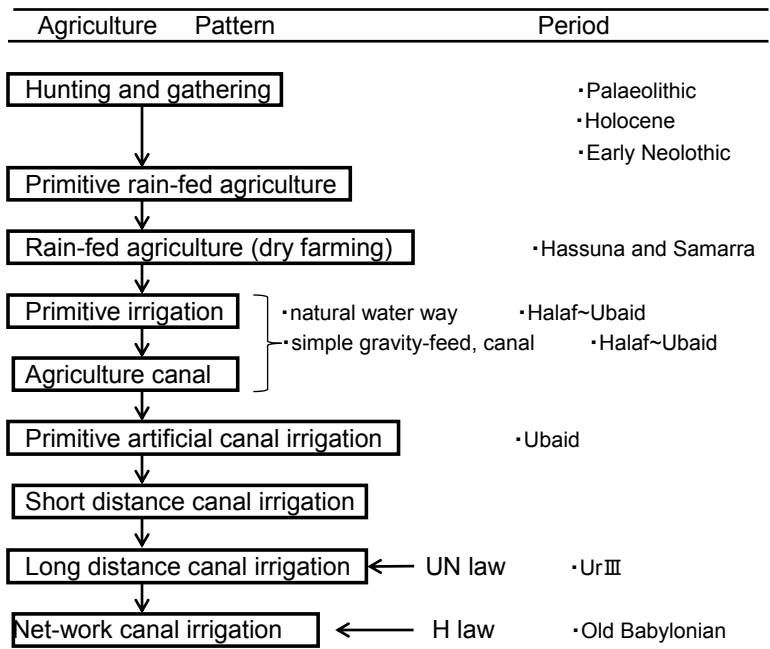


Chart.VI-1 The most probable path of transition of the dry-farming, rain-fed agriculture to the canal-based irrigation

Growing concerns on acquisition of food of human kind with their environment (nature): A narrow bent evolutional path leading to 'Irrigation' agriculture (→the first civilization) is

- (I) **Fear against nature and appeasement to nature:** gather and hunting, and cave.
- (II) **Passive utilization of nature :** puddle, pond.
- (III) **Positive utilization of natural product :** natural water way, simple gravity fed canal.
- (IV) **Artificial remodeling of nature (conversion of nature for mankind's benefit):** short artificial waterway → long distance water path → canal network → in addition to water supply, navigation of ship in major canals → transportation of residents and cargos → effective and efficient availability of river water, positive protection of natural disaster such as draught.

Flowing statements suggest the proto-type canal irrigation system:

1. People (Eridu), existed in the northern Halaf period, probably performed small scale drainage and irrigation in very limited small area of marsh⁴⁵.
2. Ubide settlements lie on natural water ways or simple gravity-feed canals⁴⁶.
3. Flood plains mixed with a dry land on natural bank (formed by alluvium soil transported by river water from upstream in the mountains (alluvium bank)⁴⁷, where cultivation of plants are impossible without irrigation and a damp uninhabitationable land without drainage⁴⁸.
4. Yamamoto and Maekawa affirmed on the southern Mesopotamian (Sumer) agriculture that except agriculture based on artificial irrigation

reproduction of community cannot be performed⁴⁹.

We can summarize approximately the evolvement route of food acquisition and preproduction system as :

Hunting and gathering (mountains) →rain-fed agriculture (high land)
→dry~ rain fed agriculture (foot hill) →proto- irrigation farming→ canal-
irrigation farming (Sumer) [see, **V-4-3-3(a)** and **V-4-1-5(b)**].

Note that the canal-irrigation farming is not native of the Sumer and is also not emerged there, but was developed from proto-irrigation farming in the north Mesopotamia and then, transmitted to the Sumer.

Proto-irrigation cultivation emerged using :

1. accumulated rain-water
2. natural pond→ artificial pond
3. flood water remained at hollow (which ruined farmer by salinisation)
4. natural water way (simple gravity-fed water way) →artificially constructed short canal (from banks of river to the farmland close to the bank)

In these periods (the Husunna-Samarra and the Halaf) the tools for civil engineering were not available due to the lack of metallurgy.

Usability of large canal

Large canal was utilized in the following areas as the main artery of transportation :

1. Supply of irrigation water to farmland

(main function).

2. Navigation of ships

- a. transportation of military force (security).

- b. transportation of commercial goods (barley)
(long distance trade).

3. Minimization of possible flood damage

(B) Advances of irrigation technology : Advantages and disadvantages

Table VI -1 shows comparison of the irrigation farming with the rain-fed agriculture.

TableVI-1 Comparison of irrigation farming with rain-fed agriculture

Rain-fed agriculture (RFA)		Irrigation farming (IF)
(I) Advantage for IF		
1. arable land(area)		•Conversion of land, which is inarable in RFA, to arable land in IF
2. crop	single crop	•double crops (crop rotation) (summer and winter cultivations)
	one year-one crop	•three year-four crops (two pause) (crop-rotation)
3. product/crop	low	•productivity ↑ (high yield/seed ratio)
4. technology	primitive	Ⓐ ridge, Ⓑ planter, Ⓒ introduction of water between ridges, Ⓓ plow driven by oxen (oxen driven plow), Ⓔ drainage
5.climate-dependence	highly weather-sensitive	•not very dependent on weather (drought) rainfall insensitive
6. product/plot		•several times higher than RFA
7.laboar		•high productivity labor
II Disadvantage for IF		
1. investment	small	•large investment of capital and labor force
2. necessary expenses	small	•large (simple ; scale up ; lower cost-effectiveness)
3. salinisation	no	•serious trouble → low productivity
4. operation and maintenance	very small	•expensive

Table VI -2 summarizes the historical data on the productivity of barley in the southern Mesopotamian plain (Lagash). The corresponding data at the Rome, medieval England, and contemporary Japan are included in the table for comparison. If the time range is limited during 2,370BC ~2,110 BC, the ratio decreased significantly and this change can be explained by salinisation (see, Table VI -5). If wheat and barley are sowed after the first winter rain these cereals can be rather easily cultivated with high yield⁵⁰.

Table VI -2 Ratio of yield/seed of barley as a parameter of the productivity of barley

Time or period	Site	(Barley) Ratio yield/seed	IR or DF	Note
fifth century BC	Babylon	200(300) ⁵¹	IR	Herodotus (hearsay)
2350 BC	Lagash	about 800 ⁵²	IR	Maekawa ⁵⁴ (Matsumoto ⁵³ , Kobayashi ⁵⁵)
2370 BC	Lagash	76.1 ^{53~55}	IR	
UrIII (2112~2004)	Lagash	about 30 ⁵⁶ 20 ⁵²	IR	
later half period of the millennium		50~100		Theophrastus (372~285BC) Maekawa ⁵⁴
ancient Rome			DF	estimated value
1318~1326	England ⁵⁷ (Roquetaire)	8.8(wheat) 3.7(oats)	DF	
modern	Japan Southern M. most of Iraq	35(wheat) 50(barley) 0(barley) ⁵⁸	DF	

IR ,irrigation DF, dry farming ; (), rich harvest

ChartVI-2 illustrates the role of irrigation in ancient Mesopotamian agriculture.

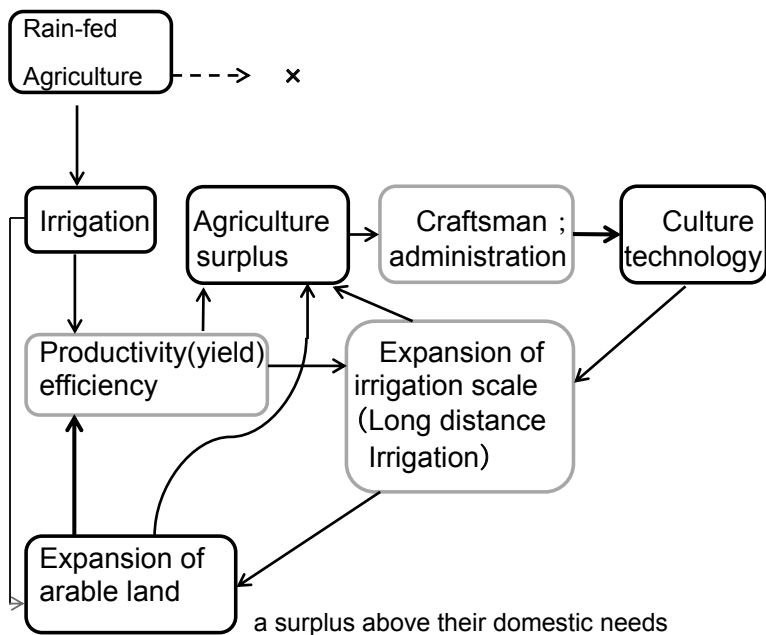


Chart VI-2 Role of irrigation in agriculture

Then, cereals had been the most widely cultivated in the ancient northern Mesopotamia. During the third millennium the yield/seed ratio at Lagash (Sumer) was constantly above 20~30, ranging mainly 50~80 (except Herodotus's data). All these data were obtained by the canal-irrigation farming showing an extremely high productivity, comparable to the present agriculture. The ratio in the ancient Mesopotamia shows a tendency of slight decrease with time. In ancient Rome and medieval England rain-fed farming was exclusively employed.

3.1.2 Farmer

(A) Tenant farmer (Group laborers in the Ur dynasty to tenant farmer in the Old Babylon dynasty)

Generally, landlord and tenant farmer were in charge of agriculture for cereal production. Of course, owner farmers were, probably, existed, but their proportion in the whole farmers was rather small. The article of the Hammurabi law code, which is concerned with the independent farmer, is H47 alone. In this case (H47) when an owner farmer failed to earn income of the operation running cost due to some causes, and if wished, he became a tenant farmer. This is a case of downfall of an owner farmer.

Tenant farmer made contracts with landlord (see, **Part IV -3.3**, p264-265). The tenant contracts were quite important document⁵⁹ (see, **3.2.2**).

When the royal territory was not extraordinary large scale a direct administration regime of the territory was adapted before the Ur III dynasty. Then, this 'large-scale' direct management agriculture had been reasonably efficient procedure at those times. In the Old Babylonian dynasty I (Hammurabi period), the royal territory exploded rapidly becoming too large in scale to be managed by single administrative body. The royal territory had numerous employees and had heavy duty to pay to all the members (including even slaves) in form of rationing of barley, seed oil, and wool. Mass labor utilized in the Ur III dynasty was fitted only for the rough-and simple-cultivation and was not expected to be applicable to the high-level, delicate, and much sophisticated canal-irrigated cultivation.

In addition, this big administrative regime had middle ~ lower managements (indirect labor force). More over, the king's territories were scattered over the new kingdom, and isolated each other. Then, it is clear

that large scale management by palace or royal family is now very tedious, inefficient, and even expensive at the period of the Hammurabi.

Direct management regime was abolished and the land was granted, in place of pay, to all the employees (all ranks), [tax-collector, judge, clerk, fortune-teller, coachman (car for festival), fisherman, cook, herder, bird catcher, hand craft man, black smith, gold smith, straw mat knitter, roofer, weaver, basket knitter]⁶⁰ of the royal farm. In this case, 'Signed certification assignment of land (with name of receiver)' was in advance presented to them⁶¹.

Area of land granted varied from 1 búr (6.5 ha)~12 búr (80 ha)⁶².

When the granted land was lost by natural disaster and (when) the occupant met the difficulty, the land was again granted to the victim⁶³.

Peoples, granted the land are surprisingly almost ordinary peoples and their kind of occupations are as the Babylonian society (see, Part II Table II -14).

'Service' in this case should strictly be distinguished from service to landlord in the medieval England. The former had very wide works by various kinds of professions and the later was only limited to cultivation and at most home work by farmers. Then 'service' in the Old Babylonian period is not the same as service which is mainly limited to cultivation and home (family) labor of England manor.

Popularization of the tenant farming occurred from the large-scale direct management of farmland in the Old Babylonian period.

Chart VI -3 illustrates the transition of large-scale, directly managed agriculture (by palace or royal family) to the tenanted agriculture.

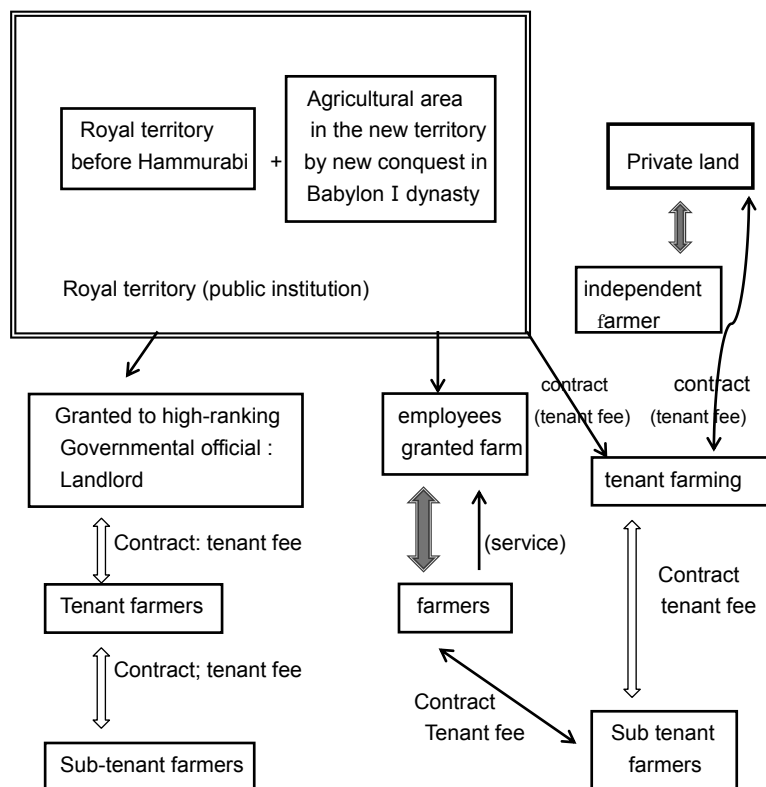


Chart VI-3 Transition of large-scale, directly-managed agriculture (palace or royal family) to tenanted agriculture

Food production system changed during the Ur III dynasty and the Old Babylonian dynasty, from mass labor at public institution to tenant farmers at private(their own farms). That was 'process of privatization' starting from the third millennium. Tenant farmers had full responsibility against the results, which grossly depended on his efforts as well as skill management

paid in the process of cereal cultivation.

Now we can regard tenant farmers in the Hammurabi period as a specialist with some degree of an expertise on the cereal cultivation by irrigation, and also him a playing manager, and not a simple laborer, much less seave.

(A). Case of a tenant farmer Ubarrum⁶⁴

(1) Time and place

From Babylonia Document

(time) : Abi-eshuh (1711~1684 BC)

(place): Northern Babylonia, suburb

(2) Economical activity performed by Ubarrum and his family

- ① employee of Royal territory
 - ⊙ granted farm 1búr(=6.4 ha) ^{65,66}
 - ⊙ service 20 day/year
- ② lease of cultivated land
 - ⊙ co-operative tenant farming (involving his brother)
- ③ rental of cultivated land
- ④ commission grazing of cattle
- ⑤ loan on credit

Income ① + ③ + ⑤ ; expenditure ② + ④ .

(3) Was Ubarrum a simple tenant farmer?

His granted farm was evidently too small to support his family.

Then, he was forced to widen his economical activity beyond tenant farmer.

As mentioned above, in the Hammurabi period, plots farm was not large enough to permit simple dry farming by a tenant farmer. Canal cultivation

was extremely delicate needing highly sophisticated skill and delicate attention being not suitable for management of huge land by slaves, big families, or assembly of small families. Mieroop⁶⁷ stated that ‘thus there were a large number of farmers who worked on small plots of land on those estates as well.’

The plot of a tenant farmer was surrounded by neighbors of farms of almost same size and water supply ended at the edge of individual farm land⁶⁸.

(B). Cultivation technology

Double cropping was applied widely in Sumer.

Cultivation technology after introducing canal-irrigation can be deduced from the farmer's calendar⁶⁹⁻⁷².

(1) Summer cultivation

- 1: In rise period (early summer ~October) the river water is induced to arable land (fallow), by opening the watergate of water-path (irrigation channel), looking out over flow of the water.
- 2: Cattles are browsed (pastured) on the farmland. Cattles trample down weed to make the land flat surface (preliminary ploughing) and at the same time the land is minuses (harrowing).
- 3: In the dry season farmer levels the land with a hoe and the land is dug using two types of plow.
4. Until the end of November sowing and plowing with use of cow-driven plow concurrently. (Seeds could often not be sown until the first rain after the long dry summer⁷³).
- 5: Winter rainfall is too small, then the land is irrigated at least three times.
- 6: Harvest time and reaping.

7: Threshing with help of cattle and sheep.

8: Off season (December ~ Spring).

(2) 'Instruction of Farmer'

We can speculate the cultivation of barley at ancient Mesopotamia from the documents other than farm calendar. That is the text book [Instruction of Farmer] , which had been used as text book at school⁷⁴.

The source of the book is said to be based on the documents of 'Management of cultivation of land at the end of the third millennium BC', written in the Ur III dynasty (the eighteenth century BC or the seventeenth century BC). In this book, farming works (Irrigation – drainage – ploughing – sowing – harvest -threshing) during April ~ May ~ next spring are concisely outlined⁷⁵.

Note that even after irrigation technology was introduced, fallowing was essential. At present the fallow system is widely employed at the rain-fed agriculture area. If only the winter cultivation was continued fallow for at least one year or more was indispensable⁷⁶.

At present (~1973), in the Iranian district where the farming is carried out without irrigation the farmer meets serious bad crop of 2~3 years in 5 years span⁷⁷.

Did the Mesopotamian farmers become rich thanks to successful development of irrigation-farming? (or did this development enrich only the ruling class?).

Now we can evaluate the real income index for two cases : (1) dry-farming and (2) irrigation-farming. Here we assume the area of farmland is the same.

Case (1), independent farmer, who had no duty to pay tax, pre-irrigation (i.e., dry farming, ruin-fed agriculture). Single crop/year ; Yield ratio (= Barley/seed) = 6; frequency of poor crop, two times during five years ; Annual income index = $1 \times 6 \times 1.0 \times 3/5 = 3.6$.

Case (2), irrigation tenant farmer ; double (one and half)* crops/year ; Yield ratio = (60 even at poor harvest) ; tax = 50% of barley harvest as income tax and tenant fee ; Annual income = $1.5 \times 60 \times 0.5 \times 1.0 = 45$.

(* a half year's fallowing in two years yields 1.5 crop/year).

Average income of an ordinary farmer in case (2) is roughly estimated about 12.5 times of case(1).

Off-season(winter) service labor for maintenance of water path is an additional of tax. It is now evident that income of a tenant farmer increased remarkably by introducing the irrigation-farming.

What is the basic character of the Old Babylonian dynasty?

Several historian's comments:

1. M.Kishimoto's comment (1968)¹¹⁴

The surprisingly advanced culture was utterly monopolized by king and his small number of aristocrats and priests, who enjoyed their prosperity, under the pitiful sacrifice of ordinary peoples, compelled to work hard. A prevailed idea that tyranny, dictatorship, and autocrat are Asian's character was formed from the above-mentioned facts.

2. K.Kuroda's comment (1969)¹¹⁵

Babylon I Dynasty was the most typical nation, the Orient formed by deprivation from the masses.

3. R. Cameron comment(1997)¹¹⁶

In early temple cities of Sumer. . . . , the social structure was definitely hierarchical, The mass of peasants and unskilled workers. . . . ,lived in **a state of servitude**, if not outright slavery; **they had no rights, property or other.**, . . . , **but nowhere in ancient civilization did private property, in modern sense**, constitute the legal foundation of society or state.

4. Paul Kriwaczek's comment (2010)¹¹⁷

Many of the judgements(in the Hammurabi law code*) strike the modern reader as fair and reasonable,(*; added by Kamide).

5. George Roux's comment (1992)¹¹⁸

The Code of Hammurabi, in many of laws is surprisingly close to our modern idea of justice.

It is self evident from Part I ~ V in this study that appropriateness of the above-mentioned comments have already been inspected.

3.1.3 Canal construction and its maintenance

High silt contamination in the Mesopotamian rivers together with extreme small flatness of the southern Mesopotamian plain brought about a high risk that every thing on the surface of the earth are buried by silt in short period, leading to the flood or shortage of supplying irrigation water.

Following construction and repair were performed in off-season of cultivation⁷⁸.

1. Construction of banks and their repair (to prevent river flood)⁷⁹.
2. Opening and digging of canals and their repair.
3. Incessantly dredge of water ways (to avoid the canal buried in the sand).

Master plans of new construction of canal network were primarily designed by estate architects with high specialty and by contractors with numerous track records.

This was a big national projects and materialized. The upper grade officers were in charge of ① procurement of labors, ② pay of wage, ③ construction materials, ④ process management, ⑤ supply of food to all employees, and ⑥ management of works according to process chart.

Sometimes, king(Hammurabi) supervised directly.

The tenant farmer was entirely responsible for the maintenance of the water path (i.e., branch of canal, flowing directly to the farmer's land).

In the Hammurabi law articles declare the farmer's duty of maintenance and punishment for violation of the laws. The projects such as digging of canal, construction of bank, or dredging of water path are obviously public works.

The funds (capital) of employment of laborers were a burden of coast inhabitants. Wage for the labors were collected in the form of barley from them⁸⁰. The water path was made as high as its surroundings, having narrow bank at the both sides of the path. Often the water path turned at right angle and the water flowed further. Owners along the water path had responsibility against main maintenance of the above banks. This rule was also applied to wide canal. The owners, whose boundary of the farmers were in contact with each other, had to make the above contact always (clear) in order. In this case, canal was administrated all the time by king's officer, that is [Bureau of Irrigation Facilities] . From the Bureau of King's inspector was dispatched, besides a local representative king had the similar authority on the matter of canal and irrigation (an example,

Siniddinam)⁸¹.

For working a large number of employed laborer were needed. For them wage barley was paid, depending on the width of bank occupied by the owner.

3.1.4 Flood

(A) Some meteorological and geological characteristics of the flood in Mesopotamia

1. Resources of flood water originates from snow melting at the Zagros and Armenia mountains, composed of lime stone. During relatively narrow period large amount of water flows down from the upstream. After the snow melting in the maintain area are exhausted river flow diminished quickly^{82,83}.

2. River water contains five times thicker silt than the Nile⁸⁴(in the form of calcium carbonate CaCO_2)⁸⁵.

Then , riverbed is readily buried under the silt, precipitated, in particular, at hill-fan or evaporated at farm.

3. Flood occurred abruptly and further without predictable sign⁸⁶.

4. Extremely flat plain in the southern Mesopotamia brought about changeableness of water-path and in addition, the flood was very restrictive. The flood washed away farmlands, houses, canals⁸⁷, and even cities.

5. Although the flood was almost seasonal, but irregular.

6. The Tigris and Euphrates have wider river-basin than the Nile. Arable land in Egypt is limited :To a long rectangle a few to 30km wide on the both sides of the Nile⁸⁸.

7. Average flow rate decreases in the order ; Tigris > Euphrates > Nile .

8. Attack of huge floods on the area of Ur, Kish, and Shuruppak was confirmed by archaeological study on the strata, corresponding to Ubaid and early ED periods⁸⁹.

(B) Some archaeological and geological evidences of flood

1. River water flowing through river, whose bed became shallow due to accumulation of soil and sand, broke the bank itself, washing away the everything. If one digs down layered village ruins, called Tel, he will reach a thick clay layer. Often he discovers the ruin of dwelling under the clay layer. This is above all direct evidence of the flood tales⁹⁰.
2. From the third millennium layer, a thick layer of pure clay deposit some eight feet thick, which separated the Ubaid layer from what Leonard Woolley considered the 'Sumerian' strata; The evidence for the flood in Sumerian history and legend⁹¹.
3. Certain archaeological evidences are discovered on the sites such as Ur, Kish, Shuruppak and etc. in the Ubaid and ED periods. Attempt of relating the flood legend to the actual flood layer is absolutely fantasy and only guess⁹².

Did canal route change by the flood?

Adams⁹³ investigated the map of canal between Nippur and Urk over the time span EDI (Early dynastic I) period(2900BC)~ED period(1763BC) (more than 1000 years) and Crawford⁹⁴ reproduced three maps in her book.

It is very interesting to note that location of canal networks in Sumer including Nippur, Issin, Shuruppak, Adab, Umma, ZabAlam, Bad Tibura, Urum and Larsa, seems likely not to be very significantly altered during almost 1000years, although the rise and fall of the above cities are, of course, observed.

(C) Flood and farmer

In Mesopotamian agriculture natural disasters, mentioned above, including flood and drought, were the largest danger factor. Once flood attacked the farm in Sumer, the farm was washed away by the flood and no longer further cultivation of the farm became impossible. What is more, the flood washed away not only farmland, but also houses, and even cities (see 3.1.4(A)4). Restoration of the farm required tremendously long time and huge expense by far beyond the capability for single or few plot owners. They were expected to escape first from the flood damage. Residential area of Sumer is located along the water way.

In drought water way (including bank of canal) will be naturally ruined merely to mass of sand.

In both (flood and drought) cases the harvest is of course zero and the victims cannot pay the tax, tenant free, operating costs, and debt if any. The Hammurabi law codes have four articles (H45, H46, H47 and H48) on the flood.

In this way there is no room to doubt that in the Mesopotamian agriculture (natural disaster) flood was the largest danger factor.

Amount of damage of farmers suffered, due to by his neighbor's careless negligence in maintenance of the water path, should be fully compensated by the perpetrator (H53, H54, H55, and H56). The above damage was considered as a kind of personal economical outbreak.

Detailed conditions of tenant contract are not very clear. The article H47 suggests some landed farmers probably belong to among unsuccessful farmers. In addition to tenant farmers, the landed farmers who suffered from natural disaster, such as flood, drought, gale and tsunami frequently attacked, on the plain of southern Mesopotamia, had zero or almost zero

harvest(income), and were forced to be ruined to tenant farmer.

The contract was formed by an initiative of the victim farmer and was made, at least perfunctorily, on the basis of mutual agreement between landlord and farmer under the predominantly disadvantageous circumstances for the farmer side. In the words such contracts are made under very favorable conditions for the landlord. Note , also, that in the above case victim farmer was not limited to only one family, but a large number of victims may have applied to the new contract.

Basic contract of reclamation between landlord and farmer was effective usually for three years (H44).

Landowner cannot claim his ownership after flood and the farmers cannot expect any assistance from the state for his loss of house and cattle. The state constructed new canal (and its network) and maintained them. New farms were built along the new canals.

(D) Level of damage caused by the flood

Level of damage caused by the flood are roughly classified in the Table VI -3.

Table VI-3 Level of damage by flood

Level	Content of damage		Note
1	water path	damaged	repair by farm
2	farm	submersed	lapse of ownership
3	water	washed away	repair by farmers
4	farm	washed away	unrecoverable and lapse of ownership
5	house	submersed and washed away	lapse of ownership
6	cattle	washed away	no compensation or public help
7	family	death(drowning)	
8	village	washed away	
9	river path	changed	disaster

Table VI -4 shows change in the rights of ownership for farm, house and cattle before and after the flood.

An exceptional case:

When granted farm was attacked by flood and washed away the farmer(owner of the above farm) suffered from poverty king granted again new farm to the victim⁹⁵.

(E) Measure against floods ; a human's ingenuity

Were inhabitants in Mesopotamia afraid of flood simply considering that it was anger of god?

At most they reinforced the banks and dredged the river bottom (i.e., passive attitude). In the case when the flood attacked canals the habitants threw away their dwellings and farms and scattered. There are some resources of king's measures against the flood⁹⁶.

Hammurabi informed his officer (Shamash-hazir) that an attack of flood of Euphrates is passing through Babylon and approaching Larsa. To minimize the possible damage by the flood he(Shamash-hazir) opened the gate leading to marsh. Water was guided to swamp near Larsa to diminish the flood in order to prevent the ruinous destruction of the bank equipments and to avoid the flood's uncontrollable damage.

3.1.5 Salinisation

(A) Decay of wheat production at Lagash

Table VI -5 summarizes the farming area, farming portion(weight), and yield of wheat at Lagash.

Table VI-4 Change in agriculture before, in , and after flood in Sumer

Before flood	Flood	After flood
Farm(landlord) : ownership	Loss of farm	New national project → New canal → New farmers (Owner- national) → New land load
House (tenant farmer) : tenancy	Loss of house	Income tax and service → Tenant farmer → House cattle
Cattle(tenant farmer) : ownership or tenant	Loss of cattle ↓ all rights of ownership and tenantry	Land load

Table VI-5 Farming area, farming portion and yield of wheat at Lagash

Year BC	Farming area ¹ wheat (%) ⁵	Residue of wheat (%) in ^{1,3} the pot	Yield wheat of ℓ /ha
3600	—	50 ¹	—
2400	16 ^{1,4}	1/6 ^{1,3}	2537 ³ (2500) ² 2179 ⁴
2100	1.8 ^{1,4}	—	1460 ³ (1500) ²
2000	—	2 ³	-
2000-1700	0 ^{1,4}	—	—
1700	—	0 ¹	897 ³

1. H. Ohba, op.cit., p133.

2. H. Ohba, op.cit., p133.-134.

3. data of Jacobsen (cited by K. Maekawa, op.cit., p244) : Thorkila Jacobsen (1982), 'Salinity and irrigation agriculture in antiquity Malibu.

4. K.Maekawa, op.cit., p244-245 (original report,1967).

5. Portion of wheat seed in the cereal pot found in the site, excavated.

During 3,000-2,000 BC wheat cultivation sharply declined at Lagash in the southern Mesopotamia at that time. Productivity (or yield ℓ /ha) of wheat markedly lowered from 2,500 ℓ /ha in 2400 BC to about 900 ℓ /ha in 1700 BC. In other words, in 1700 BC wheat production decreased by 65% at Lagash.

In the southern Mesopotamia wheat cultivation converted to barley. However, wheat production survived (until present) in the norther Mesopotamia.

(B) Salinisation : phenomenon and its mechanism

This phenomenon is said due to 'so-called' salinisation.

i.e., accumulation of calcium carbonate (white fine powders) on the soil surface of farm and this compound interrupts absorption of water through the root of cereal plants, leading finally to their death⁹⁷⁻¹⁰¹.

Table VI -4 indicates that long-span irrigation cultivation of cereal brought

about its decline, even if the same cultivation technology as before (see, **3.1.2(B)**) were continued faithfully.

The phenomena illustrated in Table IV -5 was caused by an undesirable accumulation of alluvium, contaminating calcium carbonate (white fine solid particle) on the surface of land. It was due to insufficient drainage of irrigation river water and also lack of fallowing. These phenomena were empirically well recognized by native farmers soon after adaption of irrigation (as deposit of white solid (salt) on) farm. Once the salinisation occurred on the farm, the farm could not never be recovered again to the virgin soil, because this white powder could not be removed completely from the farm.

This is a typical example of environmental pollution. In this way the advanced technology (canal- irrigation agriculture networks and their operation systems) had attained unbelievably highly productivity of cereals, but it induced simultaneously the serious damage, which could not permit the sustainability of this technology.

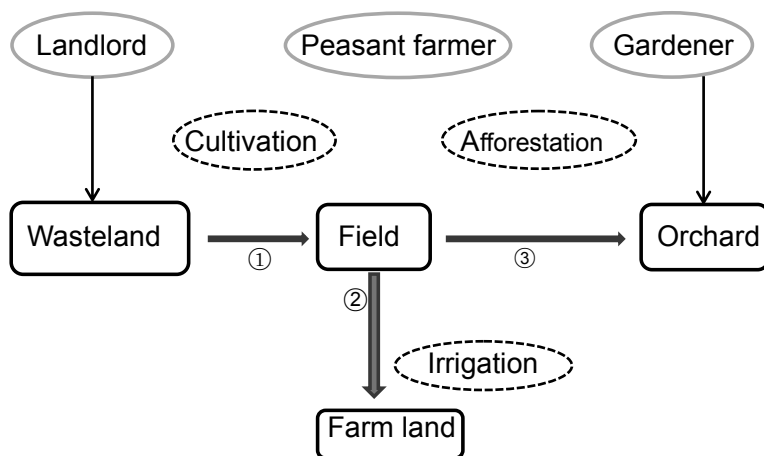
(C) Conversion of wheat to barley

Wheat was weaker in resistance than barley against salinisation and also the former needed longer period of growth than the latter. Wheat was replaced by barley in the southern Mesopotamia. Since then, wheat cultivation was severely limited to the northern Mesopotamia.

The dirted space of farm was finally abandoned, resulted in significant diminish of the total area of arable land.

Effective remedy to avoid salinisation recommended at that time was :

- 1: Complete drainage of irrigation water from the farm(to make residue of river water used for irrigation as little as possible).
- 2: Enough preliminary ploughing (**3.1.2.(b)**).



○ : human factor, □ : land, ○ : technology

Chart VI-4 Cultivation of wasteland to farmland and then afforestation to orchard

(to prevent rise of underground water through capillary action).

- 3 : Fallowing of at least one~ two years after harvest (to recover soil fertility and to suppress rising of underground water level to the ground surface, keeping the level underneath the surface).

3.1.6 Source of Mesopotamian culture.

Canal-irrigation cultivation network system is evidently the origin of ancient Mesopotamian culture.

Farmer individual was fully responsible for the end of the system and king had responsibility for the whole system.

An opinion (theory ? or delusion?), that the above system was formed by

slave's compulsory mass labor with their blood and sweat, lacks any definite certificate.

3.2 Landlord, tenant farmer, and gardener

3.2.1 Cultivation of wasteland

(A) Ordinary farmers in ancient Mesopotamia

1. There were two kinds of farmers in ancient Mesopotamia, landed farmer and tenant farmer.
2. In the Hammurabi law code, a number of articles are found on debt of tenant farmer from merchant (H 48, H 49, H 50). The articles on landed farmer are not numerous (H47). In the Old Babylonian period landlords directly cultivated a part of his farm and other parts were rented to tenant farmers. They made the contract of tenant farming.
3. Cultivation of barley, date (palm) and sesame had played a detective central role at that times.
4. The plantation of dates was exclusively performed by another different specialist (gardener) under the contract agreed between landlord and gardeners.
5. Success or failure of agricultural management was determined depending on the changeable climate or weather, together on the effort of the farmers.
6. Flood and drought were the two major uncontrollable factors, governing the yields (H48).
7. Flood and tsunami are stated in H45 and H46, and overflow and drought are found in H48.
8. In addition to the above, personal factor cannot be ignored : Negligence of cultivation (H43, H44) and defective maintenance of water

path(H53~H56).

9. When the management of landed farmers is at a dead rock, they ruined. Shifting of his business was decided by himself (H47). Man under inferior circumstance was usually forced to make a disadvantageous contract to landlord(In the Hammurabi law this was regarded as 'fair dealing').
10. Landed farmers were in debt for money to merchant from a sured (collateral) loans (H49, H50, H51).
11. For conversion of desolate wilderness a contract, which was valid approximately three years, was made between the landlord and a settler (H44).
12. We cannot overlook the relations between merchant as money lender and farmers (including tenant farmers).
13. Even tenant famers took for management all responsibility. At final phase he sold himself (H54). He made his family (wife and children) debt slaves with three years limit (H117).
14. Against damage committed by the farmer to a third party compensation was collected strictly. Any farmer was responsible for proper maintenance of water path (and bank) linking the end of water-path and his farm (H53, H54, H55, H56).
15. The literacy rate of ordinary people is suggested fairly high, in particular, the ability to read (see, also, IV 3.1.3B).
16. It cannot be considered that farmers had their houses within the area of his farmland. Their houses were surround under by fence, within walking distance, for sake of security. They gathered on the mound (hill). Many houses were built close together and densely populated.
17. The farmer and his neighbors did not have 'Joint responsibility for the

person concerned.

18. In the south Mesopotamia many houses were connected to form a village.
19. Ordinary tenant farmer's property were : house, farmland, cattle, and plow.
20. Tenant farmer had not surplus to buy other properties.

(B) Conversion of wasteland to farm and orchard

Chart VI -4 shows the scheme of conversion of wasteland to farmland via field by farmer, and then, afforestation of field (or farm) to orchard by gardener.

(1). wasteland $\xrightarrow{\textcircled{1}}$ (field) $\xrightarrow{\textcircled{2}}$ farm

Conversion of wasteland to farm was expected to consume four years (H44). Wastland should be located nearby canal and also the right of water utilization for irrigation was attached to the wasteland

- (2). Field's ground was leveled. In this case the canal water was not yet supplied to the field. But, dry-farming, if he wants, will be carried out, although very ineffective and low yield . Yield by canal-irrigated land has 20-30 times of yield by dry-farming.
- (3). Water path connecting canal (previously opened) with the field was installed (probably by public authority) and farmland was finally developed. Thus, the contract was completed.
- (4). After completion of farm, the settler will become tenant farmer by new contract between settler (now, tenant farmer) and landlord.
- (5). Gardener makes a contract of development of garden from field (or wasteland) in 5 years (H60, H63).
- (6). Gardener transplanted date palm on the garden. The period needed for

seeds of palm to grow up to yield fruit is about four years. (In Japan three years are usually necessary to harvest peach and chestnut).

- (7). Date palm is a native plant in Mesopotamia and acclimatized well to severe circumstance (low rainfall, salinisation, hot summer, flood). Then, palm cultivation was rather easy business for grower than cereal cultivation, because the above-mentioned climate did not make gardener neuroses.
- (8). After 4 years (completion of the contract), the harvest will be divided equally between landlord and gardener.
- (9). Management of the garden was entrusted to the gardener (H64) and 2/3 of harvest was taken by the landlord and 1/3 was for gardener. In this sense, the gardener of orchard was a kind of a partner of an enterprise.
- (10). For about four years gardener had no income. He must have some funds or property. In addition, he made a part of not-yet completed garden temporary farmland to cultivate barley on the basis of dry-farming.

(C) Income tax or tenant fee of farmers

Kishimoto described that 1/2~1/3 of barley income were robbed as the tenant fee⁸⁷. This is his typical misunderstanding of charge as tax.

The tenant fee contains, for examples, the expense for repair of canal (wage of contract laborers), for bank maintenance of water path, operation of canal system. Who constructed the irrigation system? Who received enormous economical benefit by using irrigation water for barley cultivation? The increase in cultivation field and increase in barley harvest, were contributed at a high rate to multiplier increase in income of the state finance. If he (Kishimoto) understood “**beneficiary payment principle**” ,

which is at the present extensively agreed and accepted concept. The kings committed to the reclamation of deserts and marshes in the southern Mesopotamia, with (investment) large outlay. The tenant farmer had the right of employment of day laborer and use of water for irrigation. If we accept the principle of “beneficiary payment principle”, then it becomes very natural to pay some amount of money (barley) to the landowner.

3.2.2 Various contracts among landlord , tenant farmer (as buyer) and laborer

In the Old Babylonian period, formats of contracts including landlord (employer), tenant farmer (buyer of land), and any laborer were almost formed. Some examples are shown below :

A. Contract of tenant farming¹⁰²

1. Property of tenant farming (farmland and orchard (date palm, wasteland)).
2. Name of property (its size and location).
3. Name of creditor.
4. Purpose of object.
5. Tenant fee (barley or silver) ; fixed ratio, or fixed amount.
6. Witness(8 persons with their father's names, including a village mayor).
7. Date.
8. Period of tenant farming ; usually 3 years.

B. Buying and selling contract

An example¹⁰³:

1. Buyer men who were far from wealthy and lived in quite modest house.

The document contained following items : Here, bracket means

Podany's excavation data¹⁰³.

2. Their size (8 acres).
3. Location (city of Terga, just north of Mari).
4. The names of the men who owned neighboring properties.
 - upper long side; (Yakum-Addu, son of Yasa-Addu),
 - lower long side ; field of (Kinau, priest of Dagan),
 - upper short side ; field of (Kinau, priest of Dagan),
 - lower short side ; field of (the palaces).Farmers had to be careful to make sure that their canals did not flood their neighbor's field.
5. Names of the following peoples with their father's names: (5-1) the neighbors, (5-2) sellers, (5-3) buyers, (5-4) the governor, (5-5) seventeen witnesses , and (5-6) a scribe (and the king).
6. Price (1 mina, 10 shekels (about 0.58 kgs) of silver (\approx 5 shekels per acre).
The document was kept in his own home.

C. Contract of employment of laborer¹⁰⁴

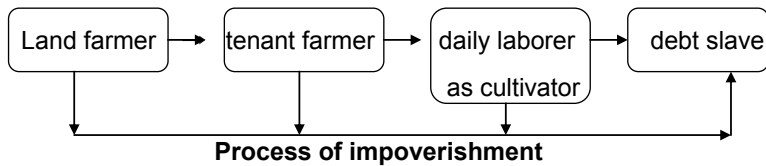
1. Name of laborer.
2. Purpose of employment.
3. Period (usually, one month or one year).
4. Pay (depending on talent needed for the work, kind of work, and the period).
5. Board (or staff meal) is added or not beside pay.
6. Special regulation : responsibility for storage of working tools and cattle; commission to the laborer; responsibility for labor interruption by escape of laborer and for violation against guarantee that they should start work until the planed due date.

D. Impoverishment of small-sized landed farmers and tenant farmers

1. Landlord had always legal priority to tenant farmers.

Barley cultivation was a nation's key industry, supplying the food to citizens and earning the foreign currency. The export of barley was a sole method to get foreign money and then to buy the foreign necessity products. Under these peculiar conditions king gave priority protection for landlord and merchant. Sometimes a single man played the two persons roles as landlord, and merchant.

2. In contract, small-sized landed farmers and tenant farmer (i.e., ordinary people) were put at disadvantageous position, and as result many ordinary people became poor. Impoverishment became serious social problem.(see, below chart).



The society brought about a relative increase in the poorest segment in the populations

3. Hammurabi and his successors, including (the tenth king) Ammis (1642-26 BC)^{107,108} and (the seventh king) Samsuiluna^{107,108} (1749-12 BC), promulgated the annulment of debts several times in order to help the people suffered from poverty. In the Old Babylonia period (2025-1595 BC), law of exempt personal debt from poor people were promulgated more than one hundred times¹⁰⁹.

E. Document of land assignment granted by King

The man, whom the royal institution issued document of land assignment to is ultimately the person, who has the right of occupation and cultivation of the land. The farmer having the document (document holder) does the practice of the cultivation or not is a legal problem.

3.2.3 Landlord and tenant farmers: Examples of unfulfillment for contracts

Table VI -6 illustrates some examples of unfulfillment for the contract.

1. The contract on development of waste field was valid to three years. Then, negligence (abandonment longer than three years) is regarded as breach to the contract.(A), (H44).
2. In the case the rent of farm was paid simultaneously at conclusion of the contract on the rental of farm the tenant farmer is responsible for any possible damages suffered by flood since then. (B.1), (H45).
3. In the case when the rent was not paid (to the landlord) the harvest (if any) is divided between the owner and the farmer according to the contract. (B2), (H46).
4. These two cases (B1 and B2) imply that immediately after the payment of rental fee the farmer can manage the lent farm at will and at the same time he should have all responsibility for the result.
5. B3 is the case when the (owner) farmer went broke (default).
6. B4 is concerned with merchant (not lord) vs. farmer : merchant was often at that time landlord. In this case reduction of the conditions in the original contract was approved.
7. In the case of no yield the tenant farmer should pay the same amount of rent as neighbors. Here, the cause of no yield is not problem. When the

Table VI-6 Some examples of unfulfillment of the contract between land lord and tenant farmers

Owner (creation) vs borrower(debtor)	Cause of trouble \implies Settlement	Article no.
(A) Reclamation of wild field : Owner of land vs farmer	If negligence(personal effect) continued 3 years \implies return the land to the owner in 4 th year of the cultivation + barley 10sur/10 iku	H44
(B) Rent of farm : 1. land lord vs tenant farmer	Case when rent was paid at contract : hit of flood and tsunami (natural disaster, super personal effect) \implies all damages are taken by tenant farmer	H45
2. land lord vs tenant farmer	Case when rent was (not paid): hit of flood and tsunami (natural disaster) \implies the harvest is divided between land lord and farmer	H46
3. land lord vs owner farmer	Farmer failed to earn the maintenance expense \implies tenant contract	H47
4. merchant vs tenant farmer	Case when farmer has debt to merchant : hit of flood or drought \rightarrow no harvest \implies no return of the debt and change of contract (no interest)	H48
5. land lord vs tenant farmer	Cultivation \rightarrow no yield \implies payment of the same amount of grain as the neighbors pay to land lord	H42
6. land lord vs tenant farmer	Negligence of cultivation (without ploughing) \implies payment of the same amount of yield to land lord + plough and fertilize the farm and return the farm to land lord	H43

neighbors get no yield the farmer and his neighbors do not pay the rent. Equal treatment with neighbors are principle in the Hammurabi law, and special treatment to a **particular farmer as an exception was not permitted**. In addition, **joint liability was not accepted there**.

8. For any personal(individual) specific situation was not considered at all.
9. A close investigation of the contracts above illustrated here shows immediately at once that the contracts made about 3000~4000 years before are basically identical to the present-day contracts. All the necessary items for the present day contracts are included even in ancient contracts, and the latter were formed at least perfunctorily on the basis of mutual agreements. It should not be over-emphasized that ancient Mesopotamia culture is essentially different from that of the contemporary world.

3.2.4 Farmer and his neighbors

Table VI -7 shows some examples of agricultural outrage by tenant farmer against neighbors.

1. Tenant farmer had the duty of secure maintenance of bank of water path.
2. The length of the path for which the farmer had responsibility is the length of path, with which his farm is directly contracted.
3. Water path was safely maintained by hardening by hand or foot or some tool and widening of bank (H53, H54). The path bottom was weeded and dredged. ➡ lost of cereals in farm(H53).
4. Gate was opened for irrigation and closed after irrigation ➡ submersion of neighbor's farm(H55), ➡ damage to neighbor's products (barley)(H56).
5. In the Hammurabi law code the four articles (H 53, H54, H55, H56) are

Table VI-7 Agricultural outrage against neighbors (see, also, 3.3c)

Article no.	Outrage \Longrightarrow Settlement
(A) Duty of maintenance of bank of water path leading to neighbor's farms	
H53	Negligence of maintenance of keeping bank (surface) hard \Longrightarrow water-intrusion through crevasse into neighbor's farm \Longrightarrow compensation of lost grains.
H54	When compensation to damage in H53 is impossible \Longrightarrow the offender sells himself and his fortune and the money obtained thus is distributed among (victims) neighbor's, suffered.
H55	Abandon of drain \Longrightarrow water-intrusion into neighbor's field \Longrightarrow the farmer compensates in similar way (to H53, H54).
H56	Water, induced by farmer \Longrightarrow intrusion into agricultural products of neighbors \Longrightarrow the farmer compensates 10 gin of barley/10 iku(area).
(B) Glass-feeding to cattle	
H57 (illegal)	Without owner's agreement man feed glass at grassland \Longrightarrow at harvest he compensates to the owner barley 20 gur/10iku.
H58	Even after whistled from palace man continued to feed his cattle grass \Longrightarrow at harvest he compensates barley 60gur/10iku.
(C) Cutting down of tree	
H59	Without assent of gardener or owner man cut-downs a tree in orchard \Longrightarrow he compensates silver 1/2 mana to the garden owner (see, LI 10).

referred to negligence or miss management of irrigation by the farmer.

In all (seven) articles the farmer is an assailant and the remaining victims in four articles are at the same time tenant farmers.

6. Table VI -7 indicates that in order to operate the canal-water irrigation agriculture smoothly the end of the system should be carefully maintained

(Note)

Here, I have no idea to answer whether victims in (B) and (C) in the table are strictly neighbors or not. But, in broad sense, they (landlord, palace) can be considered as inhabitants in the same district.

Comparison of H57 with H58 indicates that compensation to the victim of farmer (H57) (ordinary landlord) is only 1/3 of the latter (H58) (palace) and that outrage against palace is heavily punished (be careful!).

3.2.5 Landlord and gardener

Contract between landlord and gardener

1. The conversion of farm (or field) to orchard (forest of palm trees) takes 4 years (H64).
2. If gardener starts the above conversion from wild field (moor), the gardener receives 10 gur/ 10 iku of barley as an extra reward (H 63).
3. There are two kinds of contracts:
 - ① 1st contract ; development of palm forest (4 years).
 - ② 2nd contract : management of the forest (palm garden). The gardener's share is 1/3 of the harvest (H64) : dates (Phoenix dactylifera).
4. Gardener's daily tasks are :
 - ① cultivation of young dates palm trees to grow at least three years.

- ② feed of water (irrigation water) to young plants.
 - ③ artificial pollination.
 - ④ construction of fence around the garden.
 - ⑤ insect extermination.
 - ⑥ watch.
 - ⑦ harvest of palm.
 - ⑧ ripeness of fruits.
 - ⑨ processing of fruits.
 - ⑩ shipment.
5. Date palm is native of Mesopotamia and has a high adaptability to severe climate of the southern Mesopotamia (dry, hot, salinization land, . . .).
6. Excessive attention to irrigation to the garden is not necessary
7. Date has the following various merits as food^{105,106}.
- ① highly nutritious food.
 - ② sweeter (sap).
 - ③ delicious fruit as desert.
 - ④ preserved (dry) food (for home and for travel, and for export).
 - ⑤ fermented products (wine).
 - ⑥ nectar (sweetener).

Date palm may have been utilized in the southern Mesopotamia for construction of houses (pillar, ruff, and wall). On the periods of Sumer and Old Babylonia processing of agricultural products (dates) were populated to yield processed food industry at embryo state then, new value was added to the primary product (date fruit).

Table VI -8 shows some examples of unfulfillment of the contracts between landlord and gardeners.

Table VI-8 Some example of unfulfillment of contract between landlord and gardener

Article no.	unfulfillment of contract
1.(Basic contract 1) H60	Transplantation of trees on the farm to make orchard for 4 years. In 5th year the achievements are divided equally between landowner and gardener.
2. (Basic contract 2) H64	When administration (management) of the orchard is commissioned to the gardener 2/3 of the harvest is for land owner and 1/3 is for gardener.
3. H61	When the transplantation was not completed yet, neglected part is counted as the gardener's part.
4. H62	In H60, gardener neglected a part of farm without transplantation, the gardener pays the same amount of rent as neighbor's and returns the land to the owner after the land was converted to farm.
5. H63	In H62 when the original land is moor gardener converts the land to farm and in addition owner pays barley 10 gur/10iku at the first year.
6.H65	In H64 when harvest reduces due to gardener's poor management, the gardener pays harvest corresponding to neighbor's.

3.2.6 Fine and compensation of economic crime

Table VI -9 collects compensation and fine for economic crimes.

When person (assailant) gave some economic damage to man (victim) assailant pays (or compensates) some amount of goods which is χ (χ is larger than one) times of the victim's loss.

Table VI-9 Compensation and fine for economic crimes

	Times χ (fold)	Articles no.	contents of outbreak
Fine	2	H120	Embezzlement of corn deposited at store house
	2	H124	Denial of deposit which had been made in front of witness
	2	H126	Appeal of false loss to local committee
	2	H254	Thief of cows and sheep commissioned for keeping
	<3* ¹	H106	When salesman denied debt borrowed from merchant
Compensation	5	H12	When thief as seller died buyer should pay
	<6* ²	H107	When merchant denied receipt of sales man's money borrowed before
	<10* ³	H265	Selling, against contract, of oxen and sheep commissioned for keeping
	10	H8* ⁴	Thief of muskenum's oxen, sheep and fortune
	30	H8* ⁴	Thief of god's or palace's cow sheep and fortune

*¹ less than 3 times of the value of goods

*² less than 6 times of the value of goods

*³ less than 10 times of the value of goods

*⁴ see, Table III-16

1. In the articles containing 'compensate'(iriaab or irriab) the assailant (attacker) had to pay goods or money not less than 10 times ($\chi=10$) of the real value of damaged goods (H265, H8). Articles of the case $\chi=10\sim30$ corresponds to true compensation.

2. When the 'compensations' in the range of $\chi = 5\sim6$; 'iliqiz (pay)' or 'inaaddin(pay)' was used to denote 'pay'.
(H120, H124, H126 and H254 for $\chi = 2\sim3$ (inaaddin), and H107 for $\chi = 6$ (inaaddiin), and H 107 for $\chi = 6$ (inaaddin),(this is an exceptional case?).
3. In H12 ($\chi = 5$) iliqiz (pay) was used.
4. Inaaddiin was used for $\chi = 2$ (i.e., two fold) (from articles) and $\chi = 6$ (one article) and then, Akkadian verb 'Inaaddiin' was utilized for fine.
5. It seems that usage of Akkadian verb to mean pay or compensate in the H laws has close co-relations with χ value.
6. Delicate difference in nuance between iliqiz and Inaaddiin is not clear.
7. Theft of goods (including cattle and sheep) in palace or shrine were regarded as felony and a kind of grave challenge to the authority of the kingdom.

VI -4 Law of Retaliation

The retaliation is formal act (by public prosecutor) of punishing assailant (attacker) in return for what he has done to the victim.

4.1 Was the Hammurabi law code the retaliation law?

Table VI -10 collects the body injury and penalty for it in the Ur-Nammu(UN), Eshnunna (E) and Hammurabi(H) law codes. In the table, **a** in **a** \rightarrow **m**, for example, is assailant and **m** is victim : **a** is awilum, **m** is muskenum, and **s** is slave.

The law of retaliation was applied only to the case when both assailant and victim were awilum. Other cases such as **a** \rightarrow **m**, **a** \rightarrow **s**, **m** \rightarrow **a**, **m** \rightarrow **m**, **s** \rightarrow **a**, **s** \rightarrow **m**, and **s** \rightarrow **s** were allowed to employ the substitute payment.

There is no article of retaliation law in the UN and E laws except homicide and for any injury in all cases the substitute payment was utilized. This suggests that the retaliation law had been first adopted in the Hammurabi law in the Mesopotamia. Homicide was the death penalty in UN1 and it is supposed that the retaliation law had been applied to murder in the four mesopotamian law.

In the case $a \rightarrow a$, when the victim was died caused by quarrel the retaliation law was not applied and silver $1/2$ mana was the penalty (H207, see Table III -14). This is an exception of the principle of retaliation law.

4.2 The retaliation law transmitted in the Old Treatment.

Were 'Eye for Eye' and 'Tooth for Tooth' accepted or recognized in the ancient Mesopotamia and in the Mid-east ? It is said that the Hammurabi-law code had given significant influences to the Assyrian laws. More than about 800 ~ 1,000 years later than the enactment of the Hammurabi law code the Old Testament was formed (or issued?)¹¹².

Table VI -11 and Table VI -12 summarize the correspondence of the Hammurabi low codes to the Old Testament (Exodus, Leviticus, Deuteronomy, and (the New Testament) Matthew on the retaliation articles. In the last column of Table VI -11 \oplus means Exodus is more strict than the H law, \ominus is almost the same degree on rigidity, and \ominus indicates that Exodus is less severe than the H-law. Among nine items, when comparison of the both can be made, three articles in the Bible are severe than the H-laws and other six articles are almost the same in rigidity. Therefore, we can conclude that the both are approximately in same nature.

MATTHEW 5:23-38

[38 'You heard that it was said, 'Eye for eye and Tooth for tooth'. 39

Table VI-10 Body and penalty for it in the Ur-Nammu, eshnunna, and Hammurabi law codes

Position	Law code					
	Ur-Nammu	Eshnunna	Hammurabi			
1 eye (iīn, inum)		1 mana (60siqlu) [E 42]	eye [H 196]*	a → a	a → m	a → s
2.nose (appe ₂)	2/3 mana (40 siqlu) [UN 20]	1 mana(60siqlu) [E 42]				
3.tooth (Šiin, Šinnum)	2 gin (2 siqlu) [UN 22]	1 mana (60siqlu) [E 42]	tooth* [H 200]		1/3 mana (20 siqlu) [H 201]	
4. ear (uznu)		1/2 mana (30siqlu) [E 42]				
5. lip (meness)		10 siqlu [42]				
6. bone (gir ₃ paddu)	1 mana (60 siqlu) [UN 19]		bone* [H 197]		1 mana(60siqlu) [H 198]	half price of slave [H 199]
7. foot	10 gin(10 siqlu) [UN 18]					
8. finger		2/3 mana (40 siqlu) [E 43]				

* Law of retaliation

Table VI-11 Correspondence of the Hammurabi law code to Exodus on retaliation

Case	Hammurabi low code	'Old'testament exodus chap 21	Note
1.man who strikes father (or mother)	Cutting of hand ; H195	death ; Exodus 21:15	+
2.man who kidnapped child (or man)	death ; H14	death ; Exodus 21:16	=
3. man who strikes pregnant and she lost child through miss carriage	10 siqlu ; H 209	fine ; Exodus 21:22	=
4. in 3 victim died	death of man (in 3)'s daughter ; H210	death ; Exodus 21:23	=
5.injury of eye	eye ; H196	eye ; Exodus 21:24	=
6. injury of tooth	tooth ; H200	tooth ; Exodus 21:24	=
7. injury of hand	see E43 (finger)	hand ; Exodus 21:24	=
8. wound	Oath for god and pay cost of medical care ; H206	wound; Exodus 21:25	+
9. death caused by injury	Oath for god 1/2 mana ; H207	death ; Exodus 21:23	+
10. bone	(a →a) bone; H197 (a→m) 1 mana; H198 (a→s) half price of slave ; H199		
11. foot	see UN 18 (silver 10 gin)	foot ; Exodus 21:23	
12.masterwho injured his slave's eye		emancipation of the victim slave	-
13. master who injured his slave's eye		emancipation of the victim slave	-

Table VI-12 Comparison of articles on bodily injuring in the Hammurabi laws with those in Testaments

Position	Hammurabi	Exodus	Leviticus	Deuteronomy	Matthew
1. eye for eye	H196(a), H199(s)	21:24	24:20	5:38	19:21
2.tooth to tooth	H200, H201(m)		24:20	5:38	19:21
3.bone for bone	H197(a), H198(m) H199(s)		24:20		
4.hand for hand		21:24			19:21
5.foot for foot		21:24			19:21
6.cheek	H202(m → a) H203(a → a) H204(m → m) H205(s→a)	21:25			
7.(wound) (death of victim)	H206 H207				
8. bull			21:28 21:29		
9. soul for soul	H229, H230	21:23	24:21		19:21

However, I say to you. Do not resist him that is wicked : but whoever slaps you on your right cheek. Turn the other also him.]

5:23-38 is not the article H196, but probably was Exodus 21:24 . Note that when Christ was alive ordinary people did not know that H196 had been enacted about eighteen hundred years before.

4.3 Is the law code of retaliation (lex talionis) cruel?

In the Ur-Nammu and Eshnunna laws all body injures (except murder) could be compensated by the money (substitute payment) as illustrated in Table VI -10. Compensatory payment ranged from silver two gin (tooth) in

UN to silver one mana (bone in UN and eye, nose, and tooth in E). In the all four laws for homicide the law of retaliation was strictly applied. On the other hand only in the case of **a** → **a** (i.e., assailant and victim are all awilum) all bodily injuries (eye, tooth and bone) are judged by the law of retaliation. Can we say that the latter law (H) is less stern than the former two laws (UN and E).?

In the Old Babylonian period evolution of job specialization (see, Table II -14) progressed significantly in comparison with those in the UN and E periods (including appearance of numerous daily labors), resulting in large gap-widening of the rich and the poor in the society.

The transition of tenant farmers (see Chart VI -3) may be one of the various factors accelerated the above gap.

“In the previous paper (Part II **3.3.3**) I pointed out that the transfer of rather homogeneous awilum class to much highly heterogeneous and broad awilum class occurred with mass or volume expansion during the Old Babylonian period.” In the H law, all awilum irrespective of his job, including upper elite and lower daily laborer and tenant farmer, had absolutely equal legal status. In Babylonia, there was no legal rank (compare with four professions with different status (samurai, farmer, craftsman, and merchant) among ‘awilum’ majority of members, constituting the society of the Edo period in Japan).

Suppose the following two cases ; (case 1) a poor tenant farmer injured a Japanese funeral lord (Daimyo) and (case 2) the above lord killed the above-mentioned farmer. Nobody cannot image that the same legal article may be applied to these two cases equally. (This was the same in the medieval England)¹¹³.

Needless to say murder by the lord is , at present, legal equal crime as

murder by the farmer. If the substitute payment system is valid for the above two cases, the compensation will not be any burden for the upper elite awilums, such as large landowner, big merchant and senior public officer. On the other hand, for the poor, the compensation will be too much to pay, (see, Table IV -9, and IV -10), otherwise they should sell themselves. [If you are rich you can do anything (even illegal) by paying small (for you) money] . It is now clear that substitute payment will be advantageous to the upper elite awilum but unfair to the other majority. The Hammurabi law lies **on the principle of equity and equality** saying that, any assailant should feel the same pain (damages), irrespective to his social status and **value of any human being is equal and immense and cannot be replaced by the money**. This may be effective for protection of the poor from ill-treatment by upper awilum. In this sense, **the law of retaliation is a true [poor law]** .

VI -5 Miscellaneous

5.1 Domestic animals

Table VI -13 summarizes the number of the articles on domestic animals referred in the four law codes.

The parenthesis in the table means main fields of utilization. Oxen was extensively used as animals for convenience, cultivation and meat. The sheep was used for cultivation (threshing at harvest) and also for milk and meat.

Articles on the oxen occupies 64% of the total articles on domestic animals, and ten articles among them are concerned with rental. In the four law codes no article is discovered on horses. Maeda¹¹⁰ stated that in these times use of horse had not yet been popularized. Kobayashi¹¹¹ showed two

**Table VI-13 Number of the articles on domestic animals
referred in the four law codes**

Domestic animal	Ur-Nammu)	Lipit-Ishtar	Eshnunna	Hammurabi
1.Oxen(alpu) (conveyance, cultivation, and meat)	0	0	4 (E3,E40, E53,E54)	29 (H7,H8,H35 H224,H225, H241~256, H261~265, H267,H268, H271)
2.Sheep(immeru) (cultivation, milk and meat)	0	0	0	10 (H7,H8,H35 H261~265, H267,H270)
3.Donkey(iměru) (cultivation and conveyance)	0	0	2 (E56, E57)	5 (H7,H8,H224 H244,H269)
4.Pig(šahú) (meat)	0	0	0	1 (H8)
5.A herd of domestic animals(sěnu)	0	0	0	3 (H35,H57, H58)
6.Dog(kalbum)	0	0	0	0
7.Horse(sisū)	0	0	0	0

evidences that horse appeared since 3000 BC, earlier than the period which had been considered till now.

Evidence 1: A song of praise to the king Shulgi ; horse is not neither for transportation, and nor for cultivation, but the animal whose excellent mobility can be evaluated and in fact used for the military purpose.

Evidence 2 : In the Ur III dynasty of the kings Shu-Shin ~ Ibbi Sin a picture caved on a seal of script was discovered, showing horse like animal, on a man straddled.

5.2 Plants and agricultural products

Table VI -14 collects the number of the articles of plants (trees) and agricultural products cited in the four law codes.

The plantation of date palm had been very prosperous and been then popularized in the Sumerian and Old Babylonian periods, but the cited number of articles on trees were very few. Besides, the name (kind) of tree were not indicated.

Items 2 and 3 are the same (barley grain), then they are predominantly majority (15/20= 75%). Item 4 (plant oil) is probably oil of the date palm (seed). Items 5 and 6 are the sesame seed oil. Note that word 'sesame' suggests the some intimate relation with (Šamnu) or (ŠamaŠŠmiu) .

Citation of item 7(wheat) was zero. The Ur III dynasty period might be after abolishment of wheat cultivation and transition to [barley cultivation in the south Mesopotamia.

Table VI -14 shows that important foods are barley and sesame at those times.

Table VI-14 Number of the articles on plans(trees), and products cited in the four law codes

Item	Ur Nammu	Lipt-Ishtar	Eshnunna	Hammurabi
1.Tree(date palm tree?) (isaam)	0	2(LI 8, LI 10)	0	1(H59)
2.Barley(Še)	0	1(LI 27)	9(E1,E2,E3, E7,E8, E10, E11,E20,E32)	4(H55,H57,H58, H63)
3.Grain(Šeam)	0	0	0	11(H42,H43,H44, H46,H47,H49, H52,H53,H55, H105,H112)
4.Plant oil (ellum)	0	1(LI 27)	3(E1,E2,E3)	
5.Oil (Šamnu)	0	1(LI 27)	1(E32)	
6.Oil from (ŠamaŠŠmiu)	0	0		3(H50,H51,H52)
7.Wheat	0	0	0	0
8.Wool(Šipātu)	0	1(LI 27)	1(E32)	1(H104)

Table VI-15 Number of the articles on metals (except currency), birds, fishes, and animals(lion and dog) in the four law codes

	UN	LI	E	H
(A)Metal				
1. Gold	0	0	0	1(H47)
2. Silver	0	0	1(E15)	1(H7)
3. Copper(Bronze)	0	0	0	2(H215, 218)
4. Iron	0	0	0	0
(B) Bird, fish, animal				
1. Bird	0	0	0	0
2. Fish	0	0	0	0
3. Wild animal (lion)	0	0	0	2(E244.266)
4. Dog (bite)	0	0	2(E56,57)	0

5.3 Metals, birds, and wild animals

Table VI -15 shows the number of the articles on metals (except currency), birds, fishes, and wild animals referred in the four law codes.

1. Gold as metal was not cited in the UN, LI and E laws. In the H law gold as precious metal was quoted four times certainly. Gold was not manufactured in the Mesopotamia.
2. Silver was cited in twenty-six articles in the E law and was quoted in sixty one articles of the H law (see, also, Table IV -6). Silver was dealt as currency (see, also, Table IV -7).
3. Copper (Bronze) : addition of tin (Sn) to copper (approximately 10 wt%) makes bronze, the first artificial alloy, which is hard enough to find new usages (household, utensil, agricultural tools (such as plough, spade, and hoe)).
4. Iron could not be found in all the four laws. Iron had been known in those times, but iron had been used exclusively for military aim in the form of tank, spear, and shield. Ordinary people had not direct relations, in daily life, with iron.

Table VI-16 Articles on disease and care or medical treatment

	Disease	Care or Treatment
1. UN	nothing	nothing
2. LI	(a) epilepsy (LI 15, LI 16) —→	no treatment (neglect)
	(b) dizziness and antropy (LI 28) (probably, cerebral infarction or cerebral hemorrhage) —→	domestic care (no treatment)
3. E	nothing	
4. H	(a) laabu disease(H148) —→ (probably, Hansen's disease ; Lepra)	domestic care until wife's death (before her death remarriage is permitted)
	(b) serious injury —→ surgical operation	success (H215, h216, H217)
	(c) tumor of eye —→	failure(death) (H218, H219, H220)
	(d) bone fracture —→	bone setting (H221, H222, H223)
	(e) disease of intestine —→	medicines for internal use (H221, H222, H223)
	(f) biennie disease —→	(H278)

5.4 Disease and medical treatment

Table VI -16 collects the articles on disease and care or medical treatment found in the four law codes.

1. Zero article is found in the UN and E, three articles in the LI and six articles in the H law.
2. Nine diseases are discovered in the above laws. Medical doctor Azu gave medical treatment for the four diseases as follows: injury(4.H(b)), eye tumor (4.H(c)), and disease of intestine (4.H(e)).
3. 'laabu' (disease) probably corresponds to Hansen's disease (or Lepra), but 'biennie' is unclear, because no symptom was described in H278.

4. Patient of epilepsy was allowed to behave as he wants to do (LI 15), because no cure had yet been formed for epilepsy (LI 16).

LI 15 states that if attack of epilepsy is due to anger of god, the patient cannot escape from it.

5. Symptoms of the patient described in LI 28 are dizziness and atrophy. Then, I dare to diagnose him cerebral infarction or cerebral hemorrhage.

6. Surgical operations were applied by Azu to the patient to remove tumor of eye (H215) and to cure serious injury (H215). In these cases, a bronze scalpel was used for the operation(H215).

7. Orthopedic surgical treatment was applied by Azu to the patient (H221).

8. Disease of intestine was cured by doctor (Azu) of internal medicine (H221).

9. There was not distinct difference between surgeon and doctor of internal medicine and a common and medical doctor was Azu (see, Part II 4.2).

10. Surgeon's fee for a surgical operation was about twice of the fee of a medical treatment by doctor of internal medicine for treatment (H215, H211).

11. For incurable disease, medical doctor had not directly been involved. In these cases, watch and observe the patient whose disease was expected to be incurable, was recommended. This means that medical doctors well recognized the clear limit of 'medical treatment' at that time.

12. Ancient law codes suggest us that medical cure was progressed as follows:

(I) Fear against angry of god ; prayer (with spell).

(II) Passive attitude (UN) against disease, but watching and observation (nursing) against patients.

(III) Positive attitude against disease → Surgical operation and medicine

(emergence of medical science).

13. The medical treatment at those times covered the wide area of surgery, internal medicine, orthopedic surgery and psychiatry. **These treatments were based on rational approach and similar in principle to the present medical care.** For example, in H215 tumor of eye was incised with bronze scalpel and removed. This had been carried in the eighteenth century BC, not yesterday. Can you believe that?

14. **In the Hammurabi's court divine judge had not been existed.** (see, Part III ,4.3.1 and 4.3.4), **but based on rationalism** (see, also III ,3.3.1(B)). This fact may be helpful to understand the characteristics underlying the medical care at that time.

VI -6 Conclusion

1. The most probable path of transition of the dry-farming, rain-fed agriculture to the canal-based irrigation was shown in Fig.1.
2. The evolvement route of food acquisition and preproduction system was proposed (I : Fear → II : Passive utilization of nature → III : Positive utilization → IV : Remodeling of nature).
3. Proto-irrigation cultivation emerged through rain-water, pond, flood water in hollow and natural water way.
4. Large canals were used for
 - ① Supply of irrigation water to farmland.
 - ② Navigation of ships.
 - ③ Minimization of possible flood damage.
5. Detailed comparison of the irrigation farming with the rain-fed agriculture was made (Table IV -1).
6. The article of the Hammurabi law code, which is concerned with the

- independent farmer, is H47 alone.
7. Mass labor utilized in the Ur III dynasty was fitted only for rough and simple cultivation and was not expected to be applicable to the high-level, delicate, and much sophisticated canal-irrigated cultivation.
 8. Large scale management by palace or royal family became now very tedious, inefficient, and even expensive at the period of Hammurabi.
 9. Signed certification assignment of land (with name of receiver)' was in advance given by king to them (employees in the royal farms).
 10. 'Service' in this period should strictly be distinguished from service to landlord in the medieval England.
 11. Food production system changed from mass labor at public institution to tenant farmers at private(their own farms) during the Ur III dynasty to the Old Babylonian dynasty. That was 'process of privatization' starting from the third millennium. Tenant farmers were fully responsible for the any possible results.
 12. We can regard tenant farmers in the Hammurabi period as a specialist with some degree of an expertise on the cereal cultivation by irrigation, and also them a playing manager, and not a simple labor and much less slave.
 13. Even after irrigation technology was introduced, fallowing was highly essential.
 14. Construction and repair were performed in the off-season of cultivation.
 15. Owners along the water path had responsibility against main maintenance of the above banks. This rule was also applied to wide canal.
 16. Canal was administrated all the time by king's officer,
 17. For working a large number of employed laborer were needed and for

- them barley was paid as wage.
18. (A) Some meteorological and geological characteristics of the flood in Mesopotamia were shown and
(B) Some archaeological and geological evidences of flood were demonstrated.
19. Location of canal networks in Sumer including Nippur, Issin, Shuruppak, Adab, Umma, ZabAlam, Bad Tibura, Urum and Larsa, seems likely not to be very significantly altered during almost 1000years.
20. The damage of farmers, suffered by his neighbor's careless negligence in maintenance of the water path, should be fully compensated by the perpetrator (H53, H54, H55, and H56). The above damage was considered as a kind of personal economical outbreak.
21. Basic contract of reclamation between landlord and farmer was effective usually for three years (H44).
22. Landowner cannot claim his ownership after flood and farmers cannot expect any public assistance by the state for his loss of house and cattle.
23. In the Southern Mesopotamia wheat cultivation converted to barley.
due to 'so-called' salinisation. i.e., accumulation of calcium carbonate (white fine powders) on the soil surface of farm and this chemical compound heavily interrupts absorption of water through the vessels at root of cereal plants, leading finally to their withering death.
24. Long-span irrigation cultivation of cereal brought about its decline, even if the same cultivation technology as before were continued faithfully.
25. Canal-irrigation cultivation network system is evidently the origin of ancient Mesopotamian culture.
26. Farmer individual was fully responsible for the end of the system and king had responsibility for the whole system.

27. The Hammurabi law code contains a number of articles on debt of tenant farmer from merchant (H 48, H 49, H 50).
28. Cultivation of barley, date (palm) and sesame had played a central role at those times.
29. The plantation of dates was exclusively performed by another specialist (gardener) under the contract agreed between landlord and gardeners.
30. Success or failure of agricultural management was determined depending on the changeable climate or weather, together on the effort of farmers.
31. In addition, personal factor cannot be ignored : any possible damages of neighbors caused by negligence of cultivation (H43, H44) and by defective maintenance of water path(H53~H56) were strictly compensated.
Shifting of his business was decided by himself (H47).
32. For conversion of desolate wilderness a contract, which was effective approximately three years, was made between landlord and a settler (H44).
33. Even tenant farmers took for management all responsibility. At final phase he sold himself (H54).
34. Against damage committed by farmer to a third party compensation was collected strictly.
35. The literacy rate of ordinary people is suggested fairly high, in particular the ability to read.
36. Many houses were built close together and densely populated.
37. The farmer and his neighbors did not have 'Joint responsibility' for the person concerned.
38. After completion of the farm, the settler will become tenant farmer by

new contract between settler (now, tenant farmer) and landlord.

39. Gardener makes a contract of development of garden from field (or wasteland) in 5years (H60, H63).
40. Palm cultivation was rather easy business for grower than cereal cultivation, because he was not forced to worry about law rain fall, or flood.
41. Some examples are shown for the cases :
 - A. Contract of tenant farming.
 - B. Buying and selling contract.
42. Impoverishment became serious social problem.
43. Hammurabi and his successors, promulgated the annulment of debts several times in order to help the people suffered from poverty.
44. The contract on development of waste field was valid for three years. Then, negligence (abandonment longer than three years) was regarded as breach to the contract.
45. In the case the rent of farm was paid simultaneously at conclusion of the contract the tenant farmer was responsible for any possible damages suffered by flood since then.
46. In the case when the rent was not paid (to the landlord) the harvest (if any) was divided between the owner and the farmer.
47. Equal treatment with neighbors are principle in the Hammurabi law, and special treatment to a particular farmer as an exception was not permitted.
48. The contracts made about 3000~4000 years before are basically identical to the present-day contracts. All the items necessary for the present day contracts are included even in ancient contracts.
49. In order to operate the canal-water irrigation agriculture smoothly the

end of the system should be carefully maintained.

50. If gardener starts the above conversion from wild field (moor), the gardener receive 10 gur/ 10 iku of barley as an extra reward.
51. Excessive attention to irrigation to the garden is not necessary.
52. Date had the various merits as food.
53. Processing of agricultural product (dates) were populated to yield a processed food industry though at embryo state, then, new value was added to the primary product (date fruit).
54. When a person (assailant) gave some economic damage to a victim assailant pays (of compensate) some amount of goods which is χ (χ is larger than one) times of the victim's loss.
55. Akkadian verb 'Inaaddiin' was utilized for fine.
56. Usage of Akkadian verb to mean pay or compensate in the H laws has close co-relations with χ value.
57. The law of retaliation was applied in the H laws only to the case when both assailant and victim were awilum and in other cases it was allowed even in the H laws to employ the substitute payment.

There is no article of retaliation law in the UN and E laws and for any injury in all cases the substitute payment was utilized except murder. This suggests that the retaliation law had been first adopted in the Hammurabi law in the Mesopotamia.
58. Among nine items, when comparison between the H laws and Bible (Exodus) was made, three articles in Bible is much severe than the H-laws and other six articles are almost the same in rigidity. Therefore, we can conclude that the both are approximately in same nature.
59. (**MATTHEW 5:23-38**) when Christ was alive ordinary people did not know that H196 had been enacted about eighteen hundred years

before.

60. In the all four laws for homicide the law of retaliation was strictly applied.

In the Old Babylonian period evolution of job specialization resulted in large gap-widening of the rich and the poor in the society.

61. The Hammurabi law lies on the principle of equity and equality value of any human being is equal and immense and cannot be replaced by the money. In this sense, the law of retaliation is a true [poor law] .

62. Articles on the oxen occupies 64% of the total articles on domestic animals, no article is discovered on horses.

63. The plantation of date palm had been very prosperous and been then popularized in the Sumerian and Old Babylonian periods, but cited number of articles on trees were very few. Citation of item 7(wheat) was zero.

64. Important foods in, ancient Mesopotamia (in particular, the Old Babylonian dynasty was barley and sesame.

65. The medical treatments were based on rational approach and similar in principle to the present medical care.

66. In the Hammurabi's court divine judge had not been existed, but based on rationalism.

VI -7 Overview Summary

In the previous papers(part I ~ part V), the comprehensive analysis on the principal data base for the four ancient law codes (Ur-Nammu(UN), Lipit-Ishtar(LI), Eshnunna(E) and Hammurabi (H) law codes) were performed not only with contemporary view but also together with bird-eye view.

The important conclusions obtained are briefly summarized as follows:

(Part I)

- I -1. The Hammurabi law has **overwhelming size**; 2.6 times (=248/95) of the arithmetic summation of other three preceding laws (Table I -5) and the H law **is not a simple accumulation** of the preceding laws.
- I -2. **About 30~50% of the article in the three preceding law codes is transferred to the H code**(Table I -12). The transferred articles occupy **only 13%** (=32/248) (Table I -13) of the total articles of the H code : **The degree of influence of the preceding codes to the H code is very restrictive** (Table I -13).
- I -3. The main target of these laws is obviously **awilum** (Table I -5).
- I -4. Modern legal ideas emerged evidently first from , except category 2, the Hammurabi law (Table I -7).

(Part II)

- II -1. In the four law codes **three ~ four social classes with different legal positions** are found including king (Table II -1).
- II -2. **Kings** whose authority was as entrusted by the gods, has the **supreme judgement (E58,E56) and the right to give amnesty (H129)**.
- II -3. The object of the H law is **the common people**.
- II -4. **The jobs of awilum cover almost whole range of jobs of the society at the Old Babylonian period** (Table II -6a and Table II -6b).
- II -5. **Awilum** seems to have been consisted of **the citizens or the 'freeman'**, covering from the upper elite sub-class to the poor or ordinary sub-class (II -6). **The transfer of rather homogeneous awilum class to highly heterogeneous and broad class**

occurred during the period (Table II -13a and Table II -13b).

- II -7. **Any awilum had, irrespective of his job, property, social position, absolutely equal regal status (H1)(3.4.4).**
- II -8. **In the Sumer society muskenum was not existed** as one of social classes with particular legal status (Table II -1).
- II -9. **Muskenum has the legal status, equivalent to** awilum (property right, home and family right), **advantage to** awilum (legal protection to muskenum, offence embezzlement,…) and **disadvantage with** awilum (bodily injury, medical malpractice and compensation) **(3.4.2).**
- II -10. **Very significant disparity is recognized between the muskenum and the waradu (slave) (3.5.2).**
- II -11. Slave has some legal right such as the property right to make his own immovable and movables, the right of marriage and inheritance. Slave can get marry formally to awilum girl **(3.5.6).**
- II -12. It was demonstrated that the high population density and the highly sophisticated system of the irrigation, together with the nation-wide great canal networks and the plow farming, **did not fit to the simple monotonous labor work by the slaves (3.6.2).** Ancient Mesopotamia was not the servitude-system society.
- II -13 **The job specialization progressed, with acceleration, with time ;** Ur-Nammu → Lipit-Ishtar → Eshnunna → Hammurabi law codes (Table II -13 and Table II -14).

(Part III)

- III -1. **Tokens and their descendants** (cuneiform script) were formed from practical demand, mainly, in agriculture (Figure III -1).

- III -2. The **emergence of written-law** requires as preconditions of inventions and their improvements of writings and their popularization of the writings in daily (III -3, III -3.1).
- III -3. Except the E law code which was the shortest life (14~years) the life-span of ancient law codes ranges in 90~160 years (Table III -2).
- III -4. **Priests in the Hammurabi laws did not play or were not allowed to play an important role in the court.**
- III -5. There were a variety of courts differing the status and function.
- III -6. **Oath, appeared first in the Hammurabi law, continued for some thousands years to the present (Table III -6).**
- III -7. In the Hammurabi law **perjury** was the capital crime.
- III -8. Two law articles (H23 and H24) are **the world first law** which aims to **afford public support against criminal victims** (III -4.4.1.A).
- III -9. **The compensation for malpractice are legislated** (Table III -18).
- III -10. **Illegal damages to the misfortunes**, such as house and ship, **were recognized to be the object, which should be compensated (4.4.1).**
- III -11. **Legal relief** was attempted to support the social misfortune.
- III -12. **Embryonic idea of the human right emerged in the H law (4.4.2).**
 - (1) Right to live, (2) Ownership and property right (buying and selling), and (3) Right of succession and (4) Right of access to court , (5) Equal protection of the laws, and (6) Liberty of contract.
- III -13. **Terms implying testimony, evidence and witness appeared in the H law for the first time in the world legal history (5.1(1)).**
- III -14). **Plaintiff's responsibility of proof and defendant's right of disproof are written clearly (5.1(2)).**
- III -15. **First appearance of judge** is observed in the H law (5.2.1).

- III -16. **The Hammurabi law is evidently based on the principle of evidence, and is absolutely differed from divine judge** (Table III -7), **(5.1.(1))**.
- III -17. **Process of accusation→judgement** is clearly demonstrated in the Hammurabi law code (Figure III -2), (Table III -7).
- III -18. One of judge's duties is **the prohibition of double jeopardy (5.2.2.H)**.
- III -19. The H law codes have **an article with an original form of the prohibition of double jeopardy, which is now one of the fundamental principles (III 5.2.2H)**.
- III -20. The **four categories of the penalty** were found in the Hammurabi law code. (1). Death **(6.2)**, (2). Bodily punishment (Table III -12), (3). Fine (Table III -13,17), (4). Banishment (Table III -14)(**III -6.1**).
- III -21. There was **an exceptional case where the retaliation law was not applied** (Table III -14).
- III -22. Invasion of theft into temple or palace and selling of the stolen goods were regarded as serious crime **(grand larceny)** (Table III -9).
- III -23. **The penalty for the malpractice, committed by medical doctors and veterinarians, were regulated first in the world history** (Table III -18).
- III -24. **The product liability was recognized lawful in the case of house and ship** (Table III -19).
- III -25. **The fifteen articles in Japan Penalty Code (JPC) inherited from one article in the Ur-Nammu, one article in the Lipit-Ishtar and twenty seven articles in the Hammurabi law codes** (Table III -4, see also Table III -20).
- III -26. **The prerequisite necessary conditions for formal marriage,**

progressed steadily from cohabitation (UN) → cohabitation (for some period) (LI) → written oath (H) (Table III -22).

III -27. **Compensation money at divorce** (Table III -23, Table III -24 and Table III -25).

III -28. **The smallest unit constituting ancient Mesopotamia society is monogamy, formed by a combination of husband and wife (III 7.2.1)(Figure III -3~6)(III 7.2.2).**

III -29. **The size of farm seems to be fitted to the high level of irrigation and cultivation.**

III -30. **‘Equal share succession’** under the limit of **‘primogeniture’** (III 7.3.1, III 7.3.2).

III -31. **Wife** received often a **gift inter vivo** (III 7.3.3).

III -32. **Recognized slave’s son (bastard) can receive an equal share to other brothers (legitimacy) (III 7.3.5).**

(Part IV)

IV -1. **Ordinary people in the Old Babylonian period could ‘read and write’ the cuneiform script.**

IV -2. The **popularization of cram schools** had realized comparatively higher level of the literacy of ordinary people.

IV -3. **The private contracts constituted a fundamental element of the social activity.**

IV -4. The documents were kept in his private house.

IV -5. **People of all the social ranks**, such as awilum, muskenum and even slave **have the right of selling and buying of the property.** But, there were some exceptions (Table VI -2).

IV -6. There were some exceptions against the above-mentioned

exceptions (VI -3.2).

IV -7. From 'buying and selling' contract records, **'Primogeniture principal' (H165) seems rather limited (VI -3.2).**

IV -8. **Large number of the tenant contracts for each family had been preserved** in the house, where he lived.

IV -9. The tenant contracts, together with 'buying and selling' contracts, were the quite important documents, which should be kept with great attention at their homes.

IV -10. **Majority of the economic activities was guaranteed by numerous contracts.**

IV -11. In the Hammurabi law code as well as other three precedent laws any word of **copper was not discovered.**

IV -12. Barley was used only in comparatively limited number of the categories.

IV -13 **Barley was used as currency only in the agriculture and its related categories** and in the Hammurabi age barley is only a substitute currency.

IV -14. Regulations of time are year, month, and day. **In the laws no word on 'week' was found.**

IV -15. **Annual income was exclusively paid on the barley basis.**

IV -16. A typical surgical operation costs one~ one-and-half years income of a craftsman.

IV -17. Pay of day-laborer was higher in mid-winter ~ later spring term than that in late summer to early winter term.

IV -18. **Medical doctor's income is, as expected, prominently high.**

IV -19. Merchant, together with farmers (land load), became an essential sector in the old Babylonia period.

- IV -20. The relations between agriculture and commerce in the Old Babylonia period were shown in Chart.
- IV -21. Mesopotamia had a scanty of indispensable natural resources to keep a high living standard. Therefore, these materials had to be imported from elsewhere, even if it was remote from Mesopotamia.
- IV -22. **In the Old Babylonia period merchants had a kind of financial activities (mainly loans), which can be called as 'proto-banking' : Private finance to ordinary family ; Finance to business ; Long-distance trading. ; Exchange of goods.**
- IV -23. **The specular natural environments in the Mesopotamia accelerate the technological advance leading to the processing industry and development of the commerce business by the long-distance tradings.**
- IV -24. Landlords took a position superior to merchants.
- IV -25. Generally, city administration was commissioned to mayor elected among wealthy merchants.

(Part V)

- V -1. In the Maps, giant sites (Table V-7b), new sites (Table V-13). sites located on the bank of the rivers (Table V-6), and the sites on the rainfall of 200mm isohyet (Table V-14) and the modern 200mm isohyet line (dotted line) are shown for comparison.
- V -2. **The Halaf sites had already reached to the riverside of the Diyala valley in the Hassuna period and the sites continued for the whole Halaf period and since then.**
- V -3. **The Halaf sites spread far-reaching from the eastern to the western (see Map4).**

- V -4. **The several sites are nearly located on the banks of the Euphrates** (see Table V-6).
- V -5. Of course, the **ex- Hassuna –Samarra region was converted very continuously and gradually to the Halaf territory.**
- V -6. **The Euphrates basin was still a not-fully developed land until this time.**
- V -7. **At the later Halaf period there was , no more, sufficient room for development and the economy of Mesopotamia met a critical difficulty, which seemed not to be easily overcome.**
- V -8. **In the grown process a large number of small sites were absorbed into larger site and then, emerging another giant site.**
- V -9. In an extremely wide spun **the sites moved from the mountains → highland plain→ foothill → low plain** (Fig. V-1).
- V -10. **In the Halaf period the sites spread, far beyond the ex- Hassuna- Samarra area, to the westmost area.**
- V -11. **In the Halaf period the banks of the Euphrates , as well as the Tigris, were equally employed** (Table V-6).
- V -12. **The size of site varied from less than 1ha to 18ha.**
- V -13. **The gigantic sites emerged in the Halaf period**, except Ganzi Dareh, Asiab, and Abu Hüreya (21), all of which were formed in the EH (early Holocone) periods.
- V -14. **Five giant sites with space larger than 12ha are found in the Halaf period.**
- V -15. Now it is clear that **people lived at some sites for some hundred years ~ one thousand or more long years.**
- V -16. **All house materials are locally-made products.** Basically, the above materials are made of soil, and weeds. Plaster is often used

to paint the wall. The Mesopotamian houses were made of mud brick painted white at that time.

V -17. Houses evaluated from the hut, built by digging its pillar into soil or rock, to the house built on the ground stone..

V -18. **Shape of the house changed in the following ;circular or round house → rectilinear house.**

V -19. Room-number ; from single room to multi-roomed house (~ 100 room !).

V -20. **House (Çayönü) was equipped with air circular system (for storage of food) and the heating system (for room in winter).**

V -21. **Domestication of wheat and barley occurred, as expectedly by mutation.**

Emergence of domesticated cereals enabled farming on a large scale in former place of gathering.

V -22. **Careful watching or observation of the wild cereals and quick application of newly born domestic species opened the road leading to farming food production.**

(Part VI -6)

See, VI -6 of this paper.

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(Note)

The author regrets some repetitions of duplicated citations of the identical literatures, such as ref.27 = ref.29 and ref.32 = ref.33.

