

# Restoration of the Past and Three Principles of Time

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March 5, 1997

## ABSTRACT

Can the Past be restored? Poincaré and Costa de Beauregard showed that the past is not restored statistically. This follows from Bayes formula. It is mith that history can make this and moreover that history is created for this. Historian is sure that he is free for such work. In this mythological world one are living not only historians but all people. The fear of death is a cause of such confidence. In this note three Principles of Time will be formulated which say that historians can not give us the truth text-book of History of any society.

Can a reseacher restore the events of the past epoches without distortion? It is mith that history can make this and moreover that history is created for this. Historian is sure that he is free for such work. In this mythological world one are living not only historians but all people. The fear of death is a cause of such confidence. In this note three Principles of Time will be formulated which say that historians can not give us the truth text-book of History of any society.

# 1 Bayes Principle

In the book [1], Costa de Beauregard formulates the following

**Bayes Principle.** *Restoration of the Past can be made only in the case when the a priori's probabilities are known, i.e. if some knowledge about the Past is assumed the knowledge of the Present can only specify one.*

In other words, although the Future is statistically predicted the Past is not statistically restored. In [1], Costa de Beauregard gives very instructive example which belongs to Poincaré.

The a priori's probabilities are determined on the basis of historical documents, therefore there exists the hope that in the future the document will be found which will ascertain the truth. But this hope is vain as it follows from the third Principle of time (see §3).

# 2 Principle of the uncertainty of description

This principle has the following form

$$\Delta D \Delta t \geq c_1 \tag{1}$$

where  $\Delta D$  is historical uncertainty, i.e. the number of contradictory details in description of historical event which occurred for time  $\Delta t$ , and  $c_1 > 0$  is some constant.

In other words, the less time of life of investigated historical event the more contradictory details.

But it is known that many crimes are successfully investigated. Does it mean that the second Principle is false? No. There exists the concept "time of prescription". It is required the Third Principle of Time (see §3).

# 3 Principle of the interaction of epochs

Principle of the uncertainty of historical description acts only under condition of realization of another Principle which is called the Principle of the interaction of epochs and which asserts that historical uncertainty  $\Delta D$  is more when the investigated epoch lies farther from the present epoch:

$$\Delta D \leq c_2 \Delta \tau, \tag{2}$$

where  $\Delta\tau$  is time interval between present and investigated epoches,  $c_2 > 0$  is some constant. In other words, the more antique epoch the less chance to ascertain the truth.

The formula (2) is similar to the Shenon Principle which asserts that precision of information (from one system to different one) which can be transferred and received is proportional to the time that runs out

$$\Delta I \leq k\Delta\tau.$$

It follows from (1) and (2) that

$$\Delta\tau\Delta t \geq c_1c_2^{-1}$$

or

$$\Delta t \geq c_1c_2^{-1} \frac{1}{\Delta\tau} \rightarrow 0 \quad \text{under} \quad \Delta\tau \rightarrow \infty \quad (3)$$

It means that for restoration of the events which belong to time interval  $\Delta t$  of interesting for us epoch must not be too near to the present one. The constants  $c_1$  and  $c_2$  are determined from (1)-(3). They must have such values to be possible the investigations of crimes of the recent past. For example, it must exist the possibility to restore uniquely all events, i.e.  $\Delta D = 0$  if a crime was done 1 *hour* ago,  $\Delta\tau = 60 \text{ min}$ . In other words,  $c_1 \leq 1 [\text{min}^{-1}]$ , and  $c_2 \leq 1/60 [\text{min}^{-1}]$ . One can take  $c_1 = 1 [\text{min}^{-1}]$ , and  $c_2 = 1/60 [\text{min}^{-1}]$ .

We see that the problem of determination of constants  $c_1$  and  $c_2$  is not easy.

One can suppose that interaction of epoches has more composite oscillating character with increasing amplitude

$$\Delta D \leq c_2\Delta\tau f(\Delta\tau) \cos\left(\frac{2\pi\Delta\tau}{T}\right), \quad (4)$$

where  $T$  is period and  $f(\Delta\tau) \geq 0$  is non-decreasing function. The negative value of right side of (4) on segment  $\Delta\tau \in [T/4 + nT, 3T/4 + nT]$  must be interpreted as epoches for which one-valued restoration of events is possible.

Uncertainty of historical description increases for epoches  $\Delta\tau = nT$  when we deepen in the Past.

Principle (4) is held for the resilient space-time  $V^4$ , i.e.  $V^4$  when is a resilient leaf of some foliation  $\mathcal{F}$  in five-dimensional space. The resilient space-time winds round itself. A movement along 5-th coordinate gives the infinite piercing of space-time  $V^4$  at the points of Past and Future [2, 3, 4, 5]. The past epoches winds round present epoch and become nearer and nearer as this see the observer living in five-dimensional world. The (almost) oscillation follows from this. Let that

the coming has value of the Plank's length  $L \sim 10^{-33} cm$  for past epoches  $\Delta\tau = nT, n > n_0$ . Then natural fluctuations of 5-metric (electro-gravity-scalar field) will make foam topology of four-dimensional space-time. Hence the present epoch will connect with the past epoches  $\Delta\tau = nT, n > n_0$  by means of four-dimensional wormholes. Hence the events of present and past are not differed under quantum point of view. The Past is mixed with the Present. Such intermixing of Past with Present must have some projection on the events of macro-world. It follows from [2, 3] where it is shown that four-dimensional macro-wormholes connecting Past and Present can appear under perturbations of scalar fields.

Maybe oscillating character of intermixing of Past with Present was exposed in the statistical investigations of historical events by A.T.Fomenko [?].

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