New York Science Journal

ISSN 1554-0200

Volume 1 - Number 3 (Cumulated No. 3), August 1, 2008

Marsland Press

New York Science Journal

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E-mail: sciencepub@gmail.com;
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Cover Page, Introduction, Contents, Call for Papers, All papers in one file

Contents

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Investigation And The Analysis Of Water Masses At Pakistan Coastal Regions

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Abstract: In this communication we have studied the properties of water masses in the coastal regions of Pakistan with seasonal influences. Changes in the coastal are magnified by the proximity of land that does bring with an annual increase in atmospheric temperatures and a concentration of fresh water supply through river run off. This fact makes the characterization of water masses more difficult than in the deep ocean where the most of the water is not in contact with the atmosphere. The Northern Arabian Sea is least known but present studies show the presence of three high salinity features in the upper 500 meters. These masses are identified as Red Sea Water masses, Persian Gulf water and Arabian Sea High salinity water respectively. The Red Sea and Persian Gulf, contribute high salinity waters to the Arabian Sea at depth about 500 meters and 300 meter respectively, while Arabian Sea high salinity water mass is the shallowest of the three high salinity masses and lies at the bottom of the equatorial surface water. The system of water types/ masses in the Arabian Sea is complex, so that several suggestions of the dominating ones can be found. The air-sea interaction and the water exchange with the Indian Ocean control and maintain the major characteristics of the water masses and the circulation in the northern Arabian Sea. Due to the atmospheric forcing there is up-welling all along the Somali Coast that moves northward and divert to open Arabian Sea as Ras Ai – Hadd jet (RAH). The RAH jet adverts significant amounts of up-welled water into the open Arabian Sea during the southwest monsoon and acts as a conduit for Gulf of Oman waters reaching the open Arabian Sea at the end of the southwest monsoon and into the fall inter-monsoon period suggested that of formation of Arabian Sea High Salinity water. [New York Science Journal. 2008;1(3):1-11]. (ISSN: 1554-0200).

I. INTRODUCTION

Description of seawater characteristics and motions are facilitated by using the concept of water masses. This concept is analogous to that employed by meteorologists to describe air manner in weather patterns. Air masses are identified by characteristic combinations of air temperature and moisture content. These characteristics allow meteorologists to identify the past history (air source regions) of the various air masses. Examples of air masses include continental polar (cold dry air formal over high latitude land areas) and maritime tropical (warm, moist air formal over equatorial ocean areas.

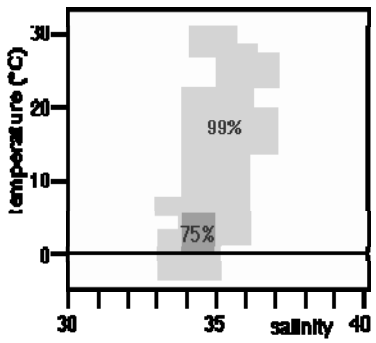
Large volumes of seawater move through the oceans as discrete water masses, identifiable by their characteristic temperatures and salinities. These water masses form at the ocean surface, and their temperatures and salinities reflect surface conditions where they formed. If a newly formed water mass is denser than its surrounding waters, it sinks to a level determined by its density relative to the density distribution in the nearby ocean. Below the surface, water masses are moved by subsurface currents, often for thousands of

kilometers. After hundreds of years (possibly 1000 years), the deep waters return to the ocean surface, again to exchange gaseous with the atmosphere and to be warmed by heat from the sun. Subsurface water mass movements can be traced by using changes in dissolved gas concentrations, especially dissolved oxygen, and the presence of pollutants from nuclear weapons testing and even atmospheric pollutants, such as chlorinated hydrocarbons. The densest water masses in the ocean form in Polar Regions, where waters of moderately high salinity are intensely cooled at the ocean surface. These processes increase the depth of the pycnocline by the sinking of dense waters from the surface. If dense enough these water masses may sink all the way to the bottom and flow along the ocean floor. A water mass of intermediate density will flow at dense waters of the surface zone. The vertical position of water mass of intermediate density is like the position of a card in a deck of cards, and the ones above have lower densities.

II. WATER MASS FORMATION THEORY

If the surface temperature is very low, convection from cooling can reach deeper than the surface layer. This situation is encountered in the Polar Regions where cold water sinks to the bottom of the ocean. This process replenishes the deeper waters and is responsible for the currents below the upper kilometer of the ocean. Areas of deep winter convection are the Weddell Sea and the Ross Sea in the Southern Ocean and the Greenland Sea and the Labrador Sea in the Arctic region.

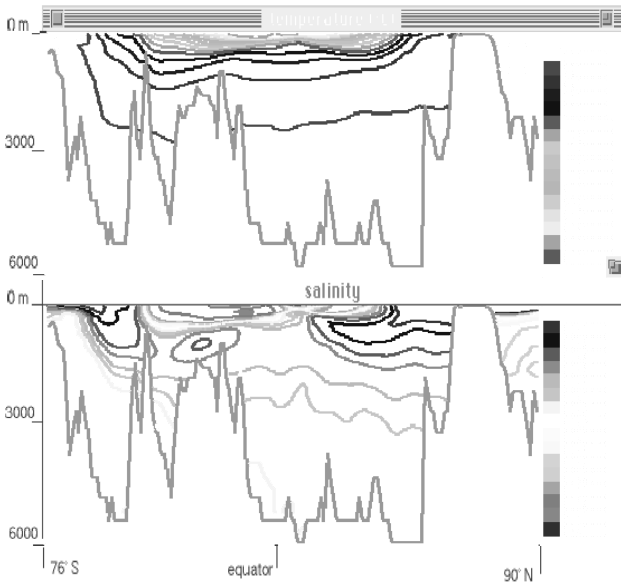
In the fig below, 75% of the ocean's water has a temperature and salinity within the dark green region, 99% have a temperature and salinity within the light colored region. The warm water outside the 75% region is confined to the upper 1000 m of the ocean.



Volumetric temperature-salinity diagram of the world ocean

The average ocean temperature is 3.8°C; even at the equator the average temperature is as low as 4.9°C. The layer where the temperature changes rapidly with depth, which is found in the temperature range 8 - 15°C, is called the permanent thermo cline. It is located at 150 - 400 m depth in the tropics and at 400 - 1000 m depth in the subtropics. Figure below shows the temperature and salinity distribution in a meridional section through the Pacific

Ocean as an example. Notice the uniformity of both properties below 1000 m depth. Notice also that in many ocean regions, temperature and salinity both decrease with depth. A decrease in temperature results in an increase of density, so the temperature stratification produces stable density stratification. A decrease in salinity, on the other hand, produces a density decrease. Taken on its own, the salinity stratification would therefore produce unstable density stratification. In the ocean the effect of the temperature decrease is stronger than the effect of the salinity decrease, so the ocean is stably stratified.



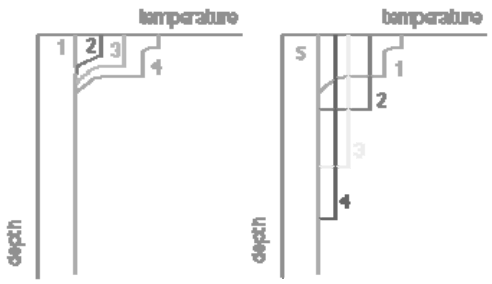
Temperature (top) and salinity (bottom) as functions of latitude and depth in the Pacific Ocean. (The image includes the Arctic Ocean on the extreme right.)

In contrast to the subsurface temperature distribution, the subsurface salinity distribution shows intermediate minima. They are linked with water mass formation at the Polar Fronts where precipitation is high; details will be discussed later in the course. At very great depth, salinity increases again because the water near the ocean bottom originates from Polar Regions where it sinks during the winter; freezing during the process increases its salinity.

In most ocean regions the wind-driven circulation, which was the focus of discussion so far, does not reach below the upper kilometer of the ocean. Water renewal below that depth is achieved by currents that are driven by density differences produced by temperature (thermal) and salinity (haline) effects. The associated circulation is therefore referred to as the *thermohaline circulation.* Since these movements are so slow, it is unrealistic to measure them directly; they have to be deduced from the distribution of water properties.

The driving force for the thermohaline circulation is water mass formation. Water masses with well-defined temperature and salinity characteristics are created by surface processes in specific locations, which then sink and mix slowly with other water masses as they move along. The two main processes of water mass formation are deep convection and subduction. Both are linked to the dynamics of the mixed layer at the surface of the ocean; so it is necessary to discuss thermohaline aspects of the upper ocean first.

Oceanographers refer to the surface layer with uniform hydrographic properties as the *surface mixed layer*. This layer is an essential element of heat and freshwater transfer between the atmosphere and the ocean. It usually occupies the uppermost 50 - 150 m or so but can reach much deeper in winter when cooling at the sea surface produces convective overturning of water, releasing heat stored in the ocean to the atmosphere. During spring and summer the mixed layer absorbs heat, moderating the earth's seasonal temperature extremes by storing heat until the following autumn and winter, and the deep mixed layer from the previous winter is covered by a shallow layer of warm, light water. During this time mixing does not reach very deep, being achieved only by the action of wind waves. Below the layer of active mixing is a zone of rapid transition, where (in most situations) temperature decreases rapidly with depth. This transition layer is called the *seasonal thermo cline*. Being the bottom of the surface mixed layer, it is shallow in spring and summer, deep in autumn, and disappears in winter. In the tropics, winter cooling is not strong enough to destroy the seasonal thermo cline, and a shallow feature sometimes called the tropical thermo cline is maintained throughout the year.

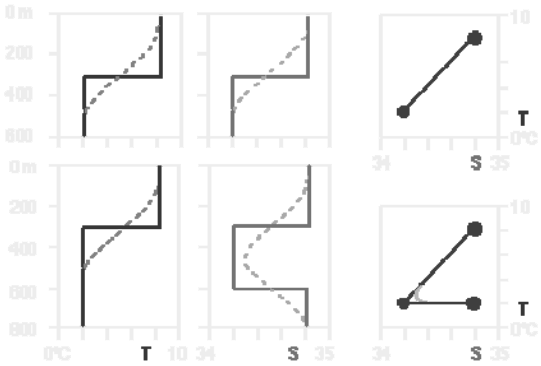


Development of the seasonal thermo cline during the year

The depth range from below the seasonal thermo cline to about 1000 m is known as the *permanent* or *oceanic thermo cline*. It is the transition zone from the warm waters of the surface layer to the cold waters of great oceanic depth The temperature at the upper limit of the permanent thermo cline depends on latitude, reaching from well above 20°C in the tropics to just above 15°C in temperate regions; at the lower limit temperatures are rather uniform around 4 - 6°C depending on the particular ocean.

Below the surface layer which is in permanent contact with the atmosphere, temperature and salinity are conservative properties, i.e. they can only be changed by mixing and advection. All other properties of sea water such as oxygen, nutrients etc. are affected by

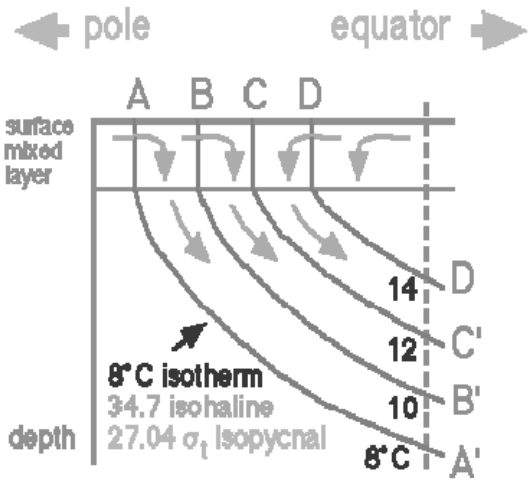
biological and chemical processes and therefore non- conservative. Water masses can therefore be identified by their temperature-salinity (T-S) combinations.



The above diagram shows the distribution of temperature (red) and salinity (cyan) with depth; the diagrams on the right show the corresponding TS-diagrams. Top: layering of warm and saline water mass found at 0 - 300 m depth above cold and fresh water mass found at 300 - 600 m). The full lines show the situation before mixing, the broken lines after mixing. The TS-diagram shows the two water masses as TS points. Before mixing only the two points are seen in the TS-diagram. Mixing connects the two TS-points by a straight line.

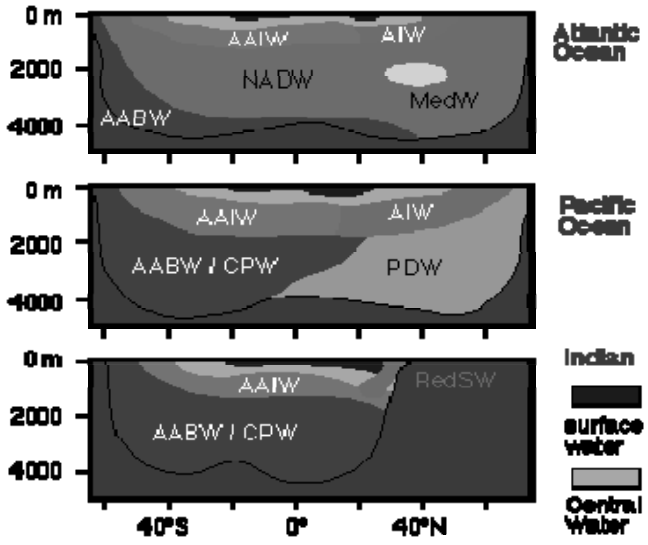
Water mass formation by deep convection occurs in regions with little density stratification (i.e. mostly in polar and sub polar regions). When the water in the mixed layer gets denser than the water below, it sinks to great depth, in some regions to the ocean floor. The density increase can be achieved by cooling or an increase in salinity (either through evaporation or through brine concentration during freezing) or both.

Water mass formation by subduction occurs mainly in the subtropics. Water from the bottom of the mixed layer is pumped downward through a convergence in the Ekman transport and sinks slowly along surfaces of constant density.

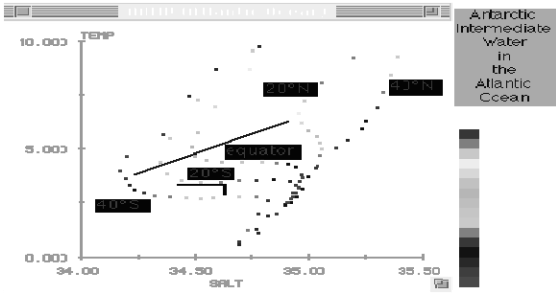


Sketch of water mass formation by subduction. First diagram: Convergence in the Ekman layer (surface mixed layer) forces water downward, where it moves along surfaces of constant density. The 27.04 sigma-t surface, given by the TS-combination 8°C and 34.7 salinity, is identified.

Antarctic Bottom Water is formed by deep convection in the Weddell and Ross Seas and fills all ocean basins below 4000 m depth; in the Pacific and Indian Oceans it is mixed with North Atlantic Deep Water, the mixture being known as Circumpolar Water. North Atlantic Deep Water is the product of a process that involves deep convection in the Arctic Ocean, the Greenland Sea and the Labrador Sea. Most Antarctic Intermediate Water is formed by deep convection east of southern Chile and west of southern Argentina and spreads into all oceans with the Circumpolar Current. Intermediate Water in the northern hemisphere may be formed by convection or subduction. Central Water, the water of the permanent thermo cline, is formed by subduction in the subtropics. Mediterranean and Red Sea waters are intrusions of high temperature; high salinity waters from two Mediterranean seas (see the discussion of Mediterranean seas below).



Sketch of the water mass distribution in the world ocean. AABW: Antarctic Bottom Water, CPW: Circumpolar Water, NADW: North Atlantic Deep Water, PDW: Pacific Deep Water, AAIW: Antarctic Intermediate Water, AIW: Arctic Intermediate Water, MedW: Mediterranean Water, RedSW: Red Sea Water, gold: Central Water, brown: surface water.

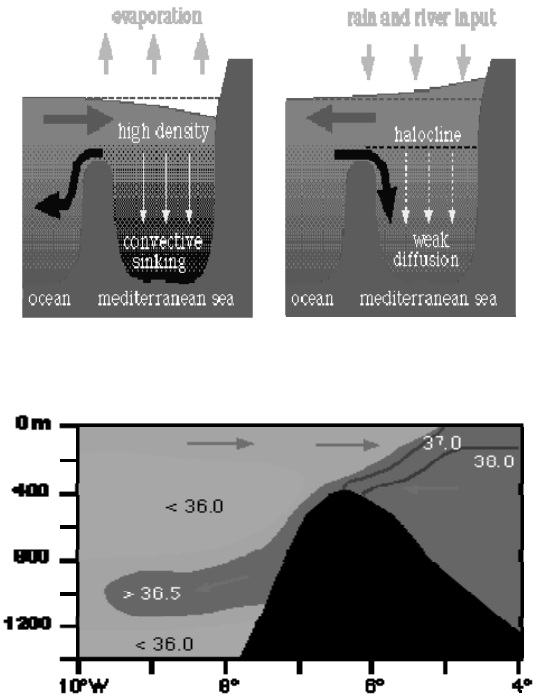


A complete description of water mass movement requires horizontal property distributions as well as vertical sections and TS-diagrams. It is then seen that the path of Antarctic Bottom Water in particular is strongly affected by the topography. For example, the deep basins of the eastern Atlantic Ocean are separated from the Southern Ocean by a sill and cannot be reached by Antarctic Bottom Water directly. They are filled through a gap in the Mid-Atlantic Ridge near the equator; in other words, flow of Antarctic Bottom Water in the eastern South Atlantic Ocean is *southward*, from the equator toward the pole. In the Pacific Ocean, input is mainly along 170°W (east of New Zealand), followed by spreading east and westward in the northern hemisphere; recirculation into the southern hemisphere occurs in the east. Input into the Indian Ocean is from the west, and in smaller quantities from the east.

III. CIRCULATION IN ARABIAN SEAS

Arabian Seas are small bodies of water characterized by very restricted water exchange with the major ocean basins. This results in different hydrodynamics and sets them apart from the remainder of the world ocean. While the circulation in most of the world ocean is dominated by wind-driven currents, the circulation in Arabian seas is determined by thermohaline processes. Two basic types of circulation can be distinguished, the concentration basin and the dilution basin. Concentration basins occur where evaporation in the region exceeds precipitation.

The circulation in Arabian seas and their water exchange with the remainder of the world ocean differs strikingly between the two types. In concentration basins, evaporation increases the salinity of the surface waters, raising their density and producing convection. Deep water renewal is therefore a nearly continuous process, and the waters of the basin are well ventilated (have relatively high oxygen content) at all depth. In dilution basins, the freshening of the surface waters resulting from excess rain and freshwater input from rivers reduces the density of the surface layer. This prevents the freshened water to reach the deeper layers. The result is the establishment of a fresh upper layer and a strong halocline. Water below the halocline is renewed only very slowly through mixing across the halocline and inflow of oceanic water through the connecting strait. Oxygen content below the halocline is therefore very low. If the basin is large and the exchange with the open ocean very restricted, oxygen levels at depth can fall to zero, preventing the existence of higher marine life.



Spreading of Arabian Water in the Indian Ocean, indicated by the salinity where maximum produced by it. The depth of the spreading is typically just below 1000 m.

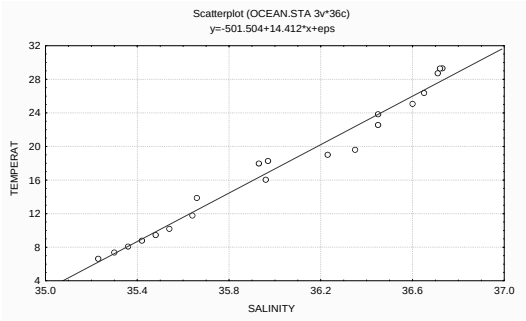
IV. WATER MASSES OF THE ARABIAN SEA

For study and analysis water masses at Pakistan coastal regions (stations) I selected 10 positions along the coastal zones of Arabian Sea. After study I observed that the basis of water mass analysis in the deep ocean is the derivation of water mass properties in the formation region are small compared to the property differences that are observed between different water masses at some distance from their formation region.

The situation in the coastal ocean is quite different. Many coastal regions are well mixed, so TS- graph which show variations of temperature and salinity with depth, are not often found in the coastal ocean. Even where vertical stratification is present, a large part of the water column is still taken up by the surface mixed layer, which in a TS- graph is represented by single water type. Undergo large changes from season to season. If the TS- Properties of the coastal ocean area averaged over the year, the resulting standard derivation is much larger than any variation that may exist as a result of stratification in the water column at any particular time. Although water properties in the coastal ocean

undergo large variation they do not fluctuate in a random fashion but follow a seasonal cycle. It is possible to make use of this and define the water masses of the coastal ocean through the use of the so called TS-time graph. Other than plotting temperature against salinity as both very with depth, we plot the values of both variables in the mixed layer against each other as they very over the year. The sequence of the observation taken over a year defines a TS- relationship in the time that reflects the weekly and secondly changes of the two properties. Establishing a TS- time graph for a particular coastal ocean region requires an observational effort over many years and is therefore much more demanding than the effort required establishing a TS-graph for a deep ocean station.

TS-graph can be produced for all other parts of the coastal ocean. They can, in fact, be a useful tool for the analysis of the hydrography of the surface mixed layer in the open ocean. In the context of coastal oceanography it is worth noting that many shelf seas have been surveyed in great detail over many decades and their data base is suitable for deriving standard deviations on a monthly basis.



T-S graph of Arabian Sea

V. CONCLUSION

In this study an effort is made to understand the properties of the waters in the Pakistan coastal ocean which are constantly changing. Seasonal influences are magnified by the proximity of land, which brings with it an increased annual range in atmospheric temperatures and a concentration of fresh water supply through river runoff. This makes the characterization of water masses more difficult than in the deep ocean, where most of the water is not contact with the atmosphere.

In the absence of air/sea interaction processes, the physical properties of water parcels can only be changed when they mix with water parcels of different origin and therefore different properties. Without mixing, water parcels retain their temperature and salinity unchanged. Temperature and salinity are therefore known as conservative properties, in contrast with non-conservative properties such as oxygen or nutrients which participate in

biochemical processes and therefore show changing concentration levels even in the absence of mixing. Temperature and salinity are therefore the most suitable hydrographic properties to define water masses and study their distribution.
`In this study, an attempt is made to understand the physics of water masses formation process. The basic tool for water mass classification and analysis is the temperature-salinity (TS) graph in which the two conservative properties are plotted against each other. A homogeneous water mass is a water mass of uniform temperature and salinity. The best known examples of this kind are the water masses of the permanent thermo cline known as Central Water.

In this we study, the air-sea interaction and the water exchange with the Indian Ocean control and maintain the major characteristics of the water masses and the circulation in the northern Arabian Sea. Due to the atmospheric forcing there is upwelling all along the Somali coast that moves northward and divert to open Arabian Sea. This advects significant amounts of up welled water into the open Arabian Sea during the southwest monsoon and acts as a conduit for Gulf of Oman.

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3/18/2008

Sinusoidal Frequency Estimation in Strong Chaotic Noise

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Abstract: The problem of sinusoidal frequency estimation in chaotic noise is considered in this paper. Since sinusoidal signal and a class of chaotic signals have different forth-order- cumulant character. Construct a high-order- cumulant data series of mixed signal, the cumulant data series has a new sinusoidal signal whose frequency is in proportion to the sinusoidal signal to be detected. Using empirical mode decomposition (EMD) method ,the cumulant data series can be decomposition to a series of intrinsic mode functions (IMFs),among which one IMF is the recovered sinusoidal signal .One merit of the algorithm is that it suit for the hybrid noises which is the mixture of chaotic signal and strong Gaussian colored noise, another merit is that it need not to know the mathematical model of the chaotic noise. The Simulation results show that the proposed algorithm is easy to implement , robust, and less complicated in calculation. [New York Science Journal. 2008;1(3):12-19]. (ISSN: 1554-0200).

Keywords: empirical mode decomposition; chaos; sinusoidal signal, forth-order-cumulant

1. Introduction

Signal generated by chaotic systems represent a potentially rich class of signals processing problems because of its highly complexity and randomicity .Recent years , a number of scholars have investigated the chaotic signal processing because a wide range of signal processes including sea clutter[1], electrocardiograph signals [2] , indoor multipath [3] and speech [4] have been demonstrate to be chaotic rather than purely random .A variety of problems involving frequency estimation in chaotic noise therefore arises in potential application context .In some cases, this problem occurs when a chaotic signal is used purposely such as narrowband interference cancellation in a chaotic direct sequence code division multiple access communication systems and communication channel identification .in other scenarios such as radar surveillance in a ocean environment[1] and angle of arrival estimation in multi- path .Obviously, the sinusoidal frequency estimation from a chaotic noise is very important in theory and application. In this research field, the phase space volume method is introduced to estimate the coefficients of an autoregressive spectrum [5], the detection of a small target in sea clutter is investigated by means of neural network method [6]. The use of nonlinear dynamic (NLD) forecasting is considered to extract messages from chaotic communication systems [7].Base on the geometry of chaotic interference, a method for signal extraction from received data contaminated with strong chaotic interference is proposed [8]. A new nonlinear technique, referred to as empirical mode decomposition (EMD), has recently been pioneered by Huang et al. [9], it was proved to be

remarkably more effective than other signal processing methods for nonlinear signals [10][11].

It's easy to estimation sinusoidal frequency when it is contaminated by most common noises. However ,when sinusoidal signal is submerged in the mixture of chaotic signal and strong Gaussian colored noise, most of conventional signal process methods failed, especially when sinusoidal signal frequency is in the middle of the frequency band of chaotic noise.

In this paper we focus our attention on the high-order-cumulant of the mixed signals .Since chaotic noise and sinusoidal signal have different character on forth-order-cumulant. By choosing proper time lags a new forth-order- cumulant data series is available, then using empirical mode decomposition approach, the sinusoidal frequency can be estimated. The following part give detail of the approach , then examples are given on the sinusoidal signals extraction from hybrid noise (chaotic noise and Gaussian colored noise). The simulation results show that the method is effective and satisfied.

2. Basic theories

Chaotic signal is a kind of special signal which is irregular but deterministic motion , and most of the signal processing methods of random signals failed to chaotic noise. For a kind of chaotic signals (Duffing , Lorenz ,Rossler,chen etc) ,which have no significant power beyond certain frequency on power spectrum ,as shown in fig1 ,if sinusoidal frequency is in the center of frequency band of the strong chaotic signal ,it will be difficult to estimation sinusoidal frequency. However, forth-order-cumulant provide a bridge to the problem . For a sinusoidal signal

$$x(t) = A * \sin(\omega_0 t + \varphi) \qquad (1)$$

, whose one dimension diagonal slice of forth- order-cumulant is

$$C_{4x}(\tau) = C_{4x}(\tau,\tau,\tau) = -3\times A^4 \cos(\omega_0 \tau)/8 \qquad (2)$$

For a hybrid signal $y(t) = x(t) + n(t) + w(t)$,

where n(t) is chaotic signal ,w(t) is Gaussian colored noise, and supposing the chaotic signal is non-correlation with sinusoidal signal ,if time lags are chosen $m\times\tau_0\times k$（$k = 1,2,\Lambda, N$）where,m is a positive constant, τ_0 is the sampling interval , a new forth-order-cumulant data sequences of the mixed signal are:

$$\left[C_{4y}(m\times\tau_0), C_{4y}(m\times\tau_0\times 2), \Lambda, C_{4y}(m\times\tau_0\times N)\right] = \begin{bmatrix} [\frac{3\times A^4}{8}\cos(m\omega_0\times\tau_0) + c_{4n}(m\omega_0\times\tau_0), \\ \frac{3\times A^4}{8}\cos(m\omega_0\times 2\tau_0) + c_{4n}(m\omega_0\times 2\tau_0), \\ M \\ \frac{3\times A^4}{8}\cos(m\omega_0\times N\tau_0) + c_{4n}(m\omega_0\times N\tau_0)] \end{bmatrix} \qquad (3)$$

Because the forth-order-cumulant of Gaussian colored noise is zero, The upper data sequences are equal to the sum of the harmonic signal whose frequency is $m\omega_0$ and the forth-order-cumulant of the chaotic signal ,the sampling interval of new data sequence is τ_0. Since the chaotic sequences are non-periodic , and its forth-order-cumulant sequences are non-periodic too. More importantly, the power spectrum of the forth-order-cumulant data sequences of the chaotic signal has low frequency

character ,as shown in fig2. Though the harmonic frequency to be estimated is in the center of the bandwidth of chaotic signal , the increase of the harmonic frequencies in the new sequence make it beyond the central bandwidth of the other components. Thus it reduces the difficulty of the detection of the harmonic frequency. Since the harmonic frequency of the new sequence is proportional to the original harmonic frequency, it is possible for the detection of the harmonic frequency.

Empirical mode decomposition is a powerful tool for nonlinear signal processing. It is based on the local characteristic time scale of the data, it is able to decompose complex signals to a collection of intrinsic mode functions (IMFs). Most important of all, it is adaptive.

At any given time, the data may involve more than one oscillatory mode, each mode, for linear or nonlinear, has same numbers of extrema and zero crossings, and only one extremum between the successive zero crossings. These modes should all be orthogonal to each other for a linear decomposition. Thus, an arbitrary signal can be decomposed to a collection of IMFs.

An intrinsic mode function (IMF) is a function that satisfies two conditions:

(1) In the whole data set, the number of extrema and the number of zero crossings must either equal or differ at most by one; and

(2) at any point, the mean value of the envelope defined by the local maxima and the envelope defined by the local minima is zero.

Comparing with simple monotone function, an IMF is a simple vibrating mode. Given a signal x(t), the algorithm of EMD can be summarized as follows:

(1) Identify all extrema of x(t), connect all the local maxima a cubic spline line as the upper envelope;

(2) connect all the local minima a cubic spline line as the upper envelope, the upper and lower envelopes should cover all the data between them;

(3) the mean of upper and lower envelopes is designated as m1, and the difference between the data and m1 is the first component, h_1, i.e.

$$h_1(t)=x(t)-m(t) \quad (4)$$

If h_1 is an IMF, h_1 is the first component of x(t).

(4) if h1 is not an IMF, h1 is treated as the original data, continue the step (1), (2) and (3), get the mean of upper and lower envelopes, which is designated as m11, if $h_{11}=h_1-m_{11}$ is still not an IMF, continue the steps (1) – (3), until the first component h_{1k} is an IMF, and designated as $c_1 = h_{1k}$. c1 is the first IMF component of x(t);

(5) separate c_1 from the rest of the data by

$$r_1(t)=x(t)-m(t) \quad (5)$$

Since the residue, r_1, still contains information of longer period components, it is treated as the new data and subjected to the same sifting process as described above, get the second IMF component of x(t) designated as c_2, the above procedure can be repeated to get nth IMF component until the residue, r_n becomes a monotonic function from which no more IMF can be extracted. Thus, we achieved a decomposition of the data x(t) into n-empirical modes, and a residue r_n, where ci, (i = 1, ⋯,n), contain different component of the signal from high to low frequency bands respectively. Frequency components in each band are different to other bands. The residue r_n is the mean trend of signal x(t).

3. Simulations

The chaotic signal which is created by Lorenz equation are adopted as the background signals. The

equation can be written as follows:

$$\begin{cases} \dot{x}_1 = p_1(x_2 - x_1) \\ \dot{x}_2 = p_2 x_1 - x_1 x_3 - x_2 \\ \dot{x}_2 = x_1 x_2 - p_3 x_3 \end{cases} \quad (6)$$

where: $p_1 = 10,. p_2 = 8/3, p_3 = 28$.In the paper, the classical fourth order Runge-Kutta algorithm is used to gain the time series of the equation (6). The initiatory 10000 data points are abandoned in the experiments to ensure the chaotic signal x(k) isn't affected by the initial conditions. To validate the effectivity of the method, the harmonic signal is submerged in the background signal which is the mixed of chaotic signal and Gaussian colored noise . When Gaussian white noise pass though a low pass filter, the Gaussian colored noise is available , here the bandwidth of low pass filter is 20hz. In the following , harmonic signals are estimated by using the proposed method in different conditions.

3.1.Simulation 1

Here the interference signals are chaotic signal and colored noise. The initial values of the Lorenz system are(1，5，9)，the harmonic signal is ω_0=2.5HZ , A=0.7, the Gaussian colored noise is the noise which Gaussian white noise pass though a low pass filter , the variance of Gaussian white noise is 15 and the signal sampling frequency is 100HZ. The figure 3 shows the sinusoidal signal is submerged by hybrid signals completely.

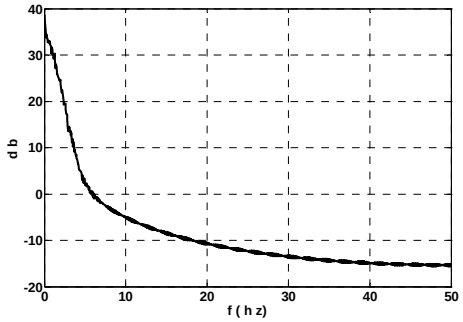

Fig 1. **The power spectrum of x1 belonging to Lorenz system**

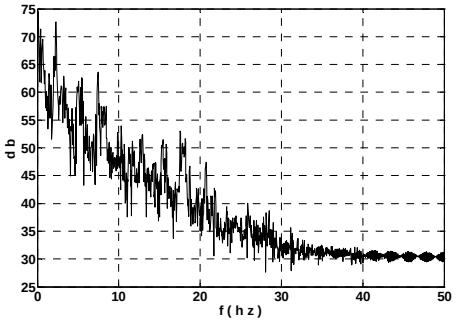

Fig 2. The power spectrum of forth-order -cumulant of x1 belonging to Lorenz system

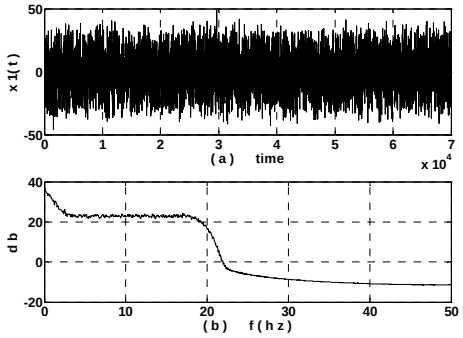

Fig 3. (a) the time series of the hybrid signals (b) the power spectrum of the hybrid signals

In order to make the sinusoidal frequency of the new data sequences does not exist in the central frequency bandwidth of the other components , the value of m should choose a bigger value. Figure 4a shows the part of first mode component c1 which is created by EMD decomposition of the new data sequence, since the modes of the EMD decomposition still contain a few adjacent mode components, the cross power spectrum is used to detect the sinusoidal frequency of the mode components. Figure 4b shows that the sinusoidal frequency to be detected is 25/10=2.5HZ. To validate the reliability of the method, figure 5 shows the cross power spectrum of c1 ,where m=12, the sinusoidal frequency to be detected is also 30/12=2.5HZ.

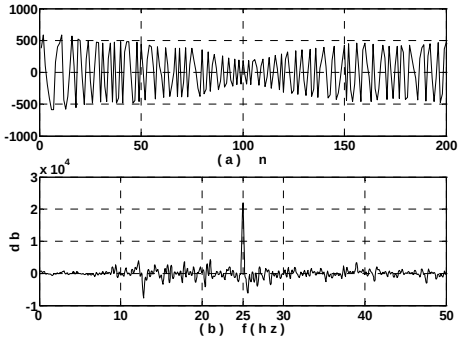

Figure4. (a) part of the first mode component (c1) of new data sequence (b) m=10, the cross power spectrum of c1

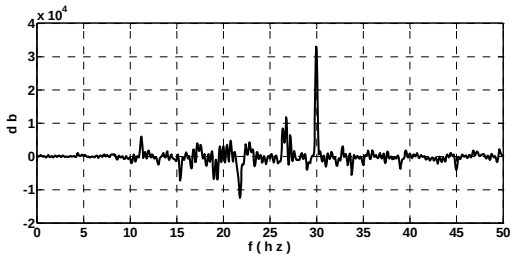

Fig 5. m=12, the cross power spectrum of c1

3.2. Simulation 2

The initial values of the Lorenz system are（10，5，9），the sinusoidal frequency is 3HZ and the amplitude is 0.6 , the variance of the Gaussian white noise is 15 , the signal sampling frequency is 100HZ. Figure 6 shows the mixed signal time series and its power spectrum. Figure 7 shows the cross power spectrum of c1 which is the first mode of new data sequence, where m=10. The sinusoidal frequency to be estimation is f=36/12=3HZ.

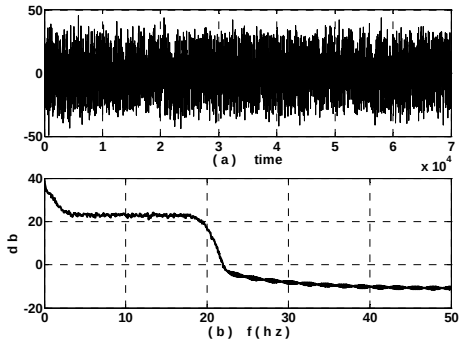

Fig 6. (a) the time series of the mixed signals (b) the power spectrum of the mixed signals

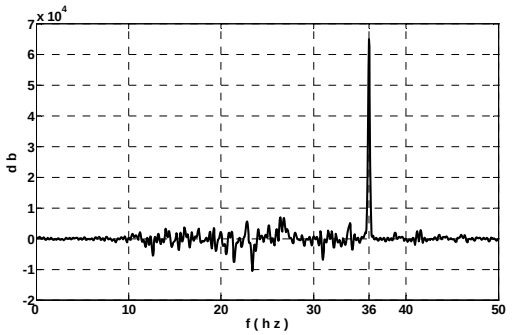

Fig 7. m=12, the cross power spectrum of c1

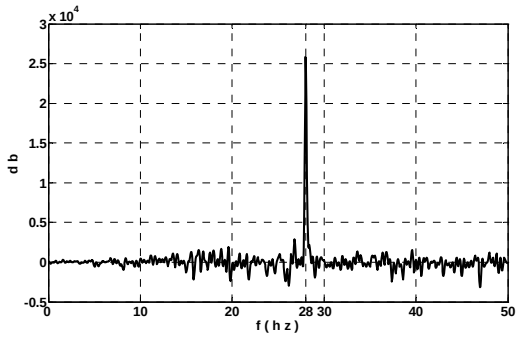

Fig 8. m=8, **the cross power spectrum of c1**

3.3. Simulation 3

Here the interference signals are chaotic signal and Gaussian colored noise. The initial values of the Lorenz system are（1，5，9），the sinusoidal frequency is 3.5HZ, the amplitude is 0.7, the variance of the Gaussian white noise is 15. Figure 8 shows the cross power spectrum of c1 ,where m=8. It's clear that the sinusoidal frequency is f=28/8=3.5HZ.

4. Conclusions

Chaotic signal process is a hot topic in recent years. Because of the high complexity of the chaotic signal, the general methods to detect the signals in the chaotic background are limited. In the paper, a new method is proposed. It uses the forth-order-cumulant character of the chaotic signal and sinusoidal signal . By adopting some specific principles ,a new forth-order- cumulant data sequences is available. In the new data sequences, the increase of the sinusoidal frequency makes it not exist in the central bandwidth of other components .this can reduce the difficulty of detecting sinusoidal signal. Based on empirical mode decomposition theory, the sinusoidal signal frequency is detected from the new reconstructed data sequence . Since the Gaussian colored noise has inherent forth-order- cumulant character , the method can be used to detect harmonic signal frequency which exists in the complex interference background such as the strong chaotic signal and Gaussian colored noise. In the simulating experiments, sinusodial signals are submerged in the strong hybrid noise, which can't be detected either in the time domain or in the frequency domain , however ,the proposed approach can estimation the sinusoidal frequency accurately in different conditions. The method is simple and feasible, it needn't to know the general parameter and initials of chaotic system and the calculations of the algorithms are small, it has important meaning in the practical application of chaotic signals .

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Jun 6, 2008

Electrical Resistivity Survey in Daibega Plain, Southwest Erbil City – Iraqi Kurdistan Region

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Abstract: Vertical Electrical Soundings (VES) with Schlumberger configuration were conducted in Daibega area (Southwest Erbil City – Iraqi Kurdistan Region). The area is a plain occupying a broad syncline. Obtaining some aquifer parameters, locating favorable groundwater zones, water depth and water types in the area were the aims of this study. For those purposes 26 VES's with 800m current electrode separation were conducted within the watershed area. Interpreted VES data were correlated with some existed borehole columns. A present iso-salinity map of the area was used to obtain the resistivity values of the aquifer water and correlated with resistivity values of aquifer rocks. An iso- depth map for the estimated water table also was constructed. Based on VES interpretations integrated with the previously present data the study showed mostly poor zones of fresh waters. Depth of water table is in the range of 50m in the central parts of the area increasing towards north and south reaching about 80 m. [New York Science Journal. 2008;1(3):20-37]. (ISSN: 1554-0200).

Keywords: Electrical Resistivity Survey; Daibega Plain; Southwest Erbil City; Iraqi; Kurdistan

1. Introduction

The rectangle-shape of the northwestern half of the Daibega plain which is tested electrically in this study is situated some 50km southwest of Erbil City covering an area of about 450km^2 (Fig. 1).

Other than rain in winter and spring seasons no surface water supply sources or water projects are present for most of the villages within the plain. The only source is the underground water. A lot of hand-dug and some deep wells have been drilled. Many of them are not suitable for human drinking because of salinity of their water. Salts are mainly because of the gypsum which exists as one of the lithological units of the Lower Fars Formation.

The resistivity method involves measuring the electrical resistivity of earth materials, by introducing an electrical current into the ground and monitoring its developed potential field. In most earth materials, electricity is conducted electrolytically by the interstitial fluid. The resistivity is controlled mostly by porosity, water content and water quality than by the resistivities of the matrix (Ayer, 1989). The main target is the identification of horizontal and vertical variations in lithology (including water type in pores), which lead to clarify the structural picture of the subsurface.

2-Geology

The area according to Numan, 1997 is located within the Zone of "Suspended Basins' of the Quasiplatform forland. This area is equivalent to the so-called "Foot Hills Zone" which belongs to the "Folded Zone" in former literature of the tectonics of Iraq (Buday and Jassim, 1987) (the upper box in Figure-1). This zone is characterized by relatively long double plunging anticlines with broad synclines in-between. They mostly trend in the NW-SE direction. The Daibega plain is a syncline between the two anticlines Avana in the northeast and Qerechugh in the southwest. In the north of the plain a third anticline (Gwair) is present in an en-echelon position (Figs. 1 and 2).

The oldest rock formations present in the area are those which belong to Oligocene age. These rock formations collectively form the core of the Qerechugh Anticline (Fig. 1). This figure also shows a cross section across the plain Table 1 shows a summary for all exposed formations in the area (cited in Al-Sudany, 2003).

Table 1. Stratigraphic Summery in Daibega area

Formation	Age	Thickness (m)	Description
SheikhAlas, Shurau, Targil, Baba Bajwan, Azkand and Anah	Oligocene	~200m	Different types of limestone (Fossiliferous, Dolomitiic, Chalky or Recrystallized)
Euphrates Formation	L.-M. Miocene	40-45	Dolomitic Limestone
Lower Fars	M. Miocene	123-200	Limestone, Claystone and Gypsum
Upper Fars	U. Miocene	46-141	Sandstone, Clatstone and Siltstone.
Lower Bakhtiari	L.Pliocene	42-200	Sandstone, Clatstone and Siltstone.
Upper Bakhtiari	U. Pliocene	30-50	Conglomerate
Quaternary	Pleistocene-Holocene	~10	Sand, Silt, Clay and Gravel

The studied area ranges topographically from mountainous reaching altitude of 750m.a.s.l. in the Qerechugh series and more than 400m.a.s.l. in the Avana series (Fig. 2) while the plain is in the range of 300m.a.s.l. The central area of the plain is slightly elevated relative to both the northern and southern parts, hence valley courses drain water due to north (Greater Zab River) and south (Smaller Zab River) following dendritic and parallel patterns. Physiographycally the area belongs to the undulated zone of the Iraqi territories.

3-Resistivity Survey and Hydrogeology

Geo-electrical resistivity techniques are popular and successful geophysical exploration for the study of groundwater conditions in the world. The resistivity of materials depends on many factors such as groundwater salinity, saturation, aquifer lithology and porosity (Lashkarippour *et al.*, 2005).

Relationships between aquifer characteristics and electrical parameters of the geoelectrical layers have been studied and reviewed by many authors (Kelly, 1977; Niwas and Singhal, 1981; Onuoha and Mbazi, 1988; Mazac *et al.*, 1985; Mbonu *et al.*, 1991; Huntley, 1986, Lois *et. al.* 2004 and Asfahani, 2006. Some researchers assume that the geology and ground water quality remains fairly constant within the area of interest and the relationships between aquifer and geophysical parameters deduced, are based on this assumption (Niwas and Singhal, 1981; Mbonu *et. al.*, 1991). Mazac *et. al.* (1990) analysed the correlation between aquifer and geoelectrical parameters in both the saturated and unsaturated zones of the aquifers.

Geophysical methods can now contribute substantially towards this initiative and can greatly reduce the number of necessary pumping tests, which are both, expensive and time consuming. The area of Daibega plain was selected as a test area to provide information on the aquifers hydrodynamic characteristics, by means of correlation tests performed between electrical parameters measured by surface geoelectrical soundings and aquifer characteristics obtained from a certain number of boreholes in which lithology is deduced and salinities were measured.

4-Data Acquisition

Electrical resistivity soundings are generally used to determine electrical resistivity variations as a function of depth. The ABEM Terrameter SAS300 was utilized in data gathering. A total of 26 Vertical Electrical Sounding (VES) were undertaken in 18 villages (Fig. 1) in the Daibega plain, one VES in each site. In four of the villages extra-two points were tested to obtain local shallow subsurface pictures. Six of the VES points were conducted nearby existed boreholes for correlation purposes. The Schlumberger electrode arrangement was used for the measurements. This type of arrangement is widely used in explorations because it is an efficient means of collecting a large number of data points (time effective in terms of fieldwork) and these observations are sensitive to the lateral position and depth characteristics of the resistivity distribution. All spreads of electrodes were designed to be in the NW-SE direction (i.e. parallel to the general structures strike). The maximum current electrode spacing (AB) was 800m. in all sounding points.

The TDS data used in this study were extracted from an iso-salinity map constructed at the beginning of 2001. This map was constructed depending upon the analyses of water in many locations within the Mekhmoor District which Daibega area is occupying the northeastern sector. Among the water wells that Al-Sudany, 2003 used are the six boreholes which were depended upon in this study for the purpose of correlation with sounding results.

5-Interpretation

The first stage of any interpretation of apparent resistivity sounding curves is to note the curve shape. This can be classified simply for three electrical layers and then combined to describe more complex field curves that may have several more layers (Reynolds, 1997). This step is called qualitative interpretation. Examples of field curves are given in Figure-4.

The visual inspection of the field data showed the presence of twelve types of curves. This large number of types reflects the horizontal variations that characterize the plain (Table 2). The first three layers in all sites are either of the following types; H, K or A. Q-type is not present anywhere in the area. Three sites showed six-layer case. They are located within the two anticlines of Qerachugh and Avana.

Sounding curves were interpreted quantitatively using the IPI2WIN Russian program. More than one iteration were tried to reach the best fit between the field curve and the calculated one. Examples of the results are given in Figure-3. The range of error in all of the interpretations was acceptable restricting between 0.03 and 5 depending upon the field data which were generally of good quality. Final results of the interpretation of all data in the 26 sounding curves are shown in Table-2. Numbers in this table are referring to villages that their names are given in Figure-1.

Table 2. True Resistivity and Horizon Depths.

VES No	ρ_1	ρ_2	ρ_3	ρ_4	ρ_5	ρ_6	ρ_5	D_1	D_2	D_3	D_4	Curve typ
1	26	18	59	2	12			1	5	47	109	KH
2	130	233	29	12				1	4	12		A
3	84	291	31	19				2	3.4	89.4		A
4	215	135	62	34	1			1	10	49	282	AA
5	76	21	117	21	30	12	1	2	10	50	207	KHK
6	67	103	13	52	4			4	20	43	202	IK
7	43	22	100	13	20			1	2	7	54	KH
8	83	196	16	33	13			1	1.8	7	37	IK
8A	230	23	84	16				2	4	33		HK
8B	70	15	26	8	17			1	7	8	41	HKH
9	104	1	38	6	12	17	1	1	2	4	127	IAA
10	65	183	16	9	20			1.5	2.5	17	56	IA
11	94	29	9	13				1	5	92		I
11A	34	5	14	6	17			1	1	18	94	HKH
11B	43	17	6	13				2	14	86		AH
12	15	19	9	18	9			3	10	39	116	KHK
13	109	18	10	25				1.5	50	145		I
14	146	29	5	8				1	3	52		K
14A	48	36	6	3	10			1	8	43	74	AAH
14B	103	21	2	7	12			1	2	1	135	AHQ
15	79	10	25	13				1	35	95		K
16	103	85	27	49	19			4	12	63	154	IK
17	101	26	10	17				1	2.5	106		K
18	19	3	56	8	52			1.5	3	20	45	KHK
18A	19	4	68	13	65			1	2	10	19	HKH
18B	52	107	20	54	17			1	1	12	46	KHK

ρ: resistivity (Ohm.m), D: depth to horizon (m)

The following observations could be concluded from this table:

1- A maximum resistivity value of 291 Oh.m. was registered in VES 2 while a minimum of 1 Ohm.m. was registered in the deeper parts of VES 4, 5 and 9.
2- Majority of the VES curves showed the presence of five electric horizons (14 points out of 26).
3- Maximum depth of investigation was 282m below surface in VES 4.

4- VES 2 and 3 have the maximum values of resistivity among all. They are located within the boundary of Gwair Anticline.
5- The resistivity value of the uppermost horizon ranged from 15 to 230 Ohm.m.

6-Correlation with Existed Wells

Six of the VES points were correlated with six of the nearby existed wells (Figs. 4 and 7). The following observations could be given:

1-Water table depths as interpreted from the resistivity data are consistent with those of the wells to a good extent if we keep in mind that the drawdown is a normal phenomenon in Erbil and surrounding areas due to the drought conditions which the whole area suffered cyclically during the last ten years. Resistivity measurements in this study were taken about four years after the date of obtaining the well columns in 2001 (Al-Sudany, 2003). From the resistivity data the water table depth is deeper in all six localities than those of wells. This difference is attributed to the above-mentioned drawdown.

2-Resistivity values of the aquifer rocks range between 8 and 34 Ω.m. The minimal values indicate salty water contents.

3-The aeration zone in the wells is composed of mixture of clay, silt and sand with variable ratios. Their resistivity value ranges from 5 to 62 Ω.m. depending on that ratio and salty materials content. The electric properties of the aeration zone are subject to seasonal or sporadic changes which depend mainly on the amount of precipitation and on the temperature and barometric conditions (Ogilvy *et al*., 1980).

7-Iso-Prameter Maps

7.1-Iso-Resistivity Map of the Aquifer Rocks

The map of the iso-resistivity values in the Daibega plain (Fig. 5) shows two main anomalous zones. The high values are located in the area north of Mekhmoor town occupying the western central parts while the lower values are occupying the central northern parts. According to this map the first zone is likely to be better for obtaining waters of lower values of salts relative to other zones of the studied area.

7.2- Iso-Resistivity Map of the Aquifer Water

Aquifer water conductivities (inverse of resistivity) of the Daibega area were derived depending upon the values of Total Dissolved Salts (TDS) aforementioned by multiplying them by (1.4). This conversion factor was used to make the resistivities in units of Ω.m. (Geo-Hydrology.com)

This conversion factor is often used when actual factor of a certain area is not known. Table (3) shows conductivity and resistivity values as well as some other aquifer factors.

Table 3. Some Aquifer Parameters.

VES No.	$\rho_{aquifer.rocks}$	W.T.D.	T	TDS	σ	ρ_{water}
1	7	47	62	500	700	0.149
2	12	12		900	1260	0.083
3	19	89		1400	1960	0.053
4	34	49	23	500	700	0.149
5	21	50	157	4200	5880	0.0177
6	13	20	23	3750	5250	0.0198
7	20	45		5000	7000	0.0148
8	13	37		3400	4760	0.022
9	12	127		3400	4760	0.022
10	20	56		4000	5600	0.0186
11	13	92		2700	3780	0.028
12	18	39	75	1280	1400	0.074
13	10	50	95	450	630	0.165
14	5	52		1400	1960	0.053
15	25	95		4500	6300	0.017
16	49	63	83	3000	4200	0.025
17	17	102		1800	2520	0.041
18	8	20		500	700	0.149

ρ : resistivity (Ohm.m.), σ: conductivity (μs/cm), T: thickness (m), TDS: Total Dissolved Salts (ppm), W.T.D.: water table depth (m).

Figure 6 shows the map of iso-conductivity values of the area. This map indicates a sharp subdivision between a low-conductivity values zone in the northwestern part and a high values zone in the southeastern part. The former part is being related geologically to the northeastern plunges of both the Qerachugh and Avana Anticlines and the Gwair Anticline. This geological subdivision is reflected as change in conductivity distribution which is also affected by the topographic change along the same direction (see also Figure-2)

The map of the iso-resistivity of the aquifer water (Fig. 7) on the other hand shows three zones of high resistivity water (Zones A, B and C in figure 7). The first one (A) occupies the area of high resistivity aquifer rocks mentioned above in figure (6) north of the Mekhmoor town. The coincidence of these two types of data in the same zone gives a clue that this zone is actually the better from the water type point of view in the studied area. Geologically this zone is located on the northeastern limb of the Qerachugh Anticline. This limb is steeper than the northeastern limb of the syncline (southwestern limb of Avana Anticline) (Fig. 1). Because of the high dip it seems that the depth of investigation of the resistivity method used in this study (VES 5, 6, 8 and 9) as well as the water from which the TDS tests were taken are within the uppermost rock formations. These are the Upper Fars, Lower Bakhtiari, Upper Bakhtiari and Quaternary deposits. They collectively overlie the main source of salts in the area which comes from the Lower Fars Formation.

Zones B and C on the other hand have almost the same geological conditions. The first is located on the southeastern Gwair Anticlinal plunge near to the narrow syncline between Gwair and Qerachugh Anticlines while the second occupies the northwestern plunge area of Avan Anticline.

The southeastern parts on the other side show decreasing of resistivity values towards southeast. This indicates the increase in salts and coinciding with the decrease in rock resistivities (Fig. 5) and increasing conductivities (Fig. 6).

7.3- Iso-Depth Map of the Water Table

The depth to water map in Figure-8 shows that the central parts of the north and south show higher depths (more than 50m) for water table than the central area (less than 50m). The six VES points that were carried out near water wells show good consistency in results. Again a subdivision between the northwest parts of the whole area with the southeastern part can be noted. This can be related as mentioned before with the surface topography which in turn may reflect structural features.

8-Geo-electric Sections

These sections are the vertical distribution of resistivities within a particular volume of the earth. The section consists of a sequence of uniform horizontal (or slightly inclined) layers (horizons). The layer's true resistivity is noted on each one for each VES sounding. After that several sections for VES points which are located on a certain traverse can be linked together to show a cross sectional view of the traverse. Each layer (horizon) in a geo-electrical section my completely be characterized by its thickness and true resistivity.

1-The two geo-electric sections A and B in Figure-9 were constructed between VES's 14, 15 and 16 and VES's 6, 7 and 17. They show the subsurface configuration along lines cutting the Avana structure in the E-W direction (Fig. 9A). and cutting the plain in-between the two anticlines (Fig.9B), in the NE-SW direction. Though the number of VES points is not so adequate to make a full interpretation, some conclusions could be derived however.

In the first section more than one inter-fingering within horizons can be observed. Below water table, the aquifer seems to be containing fresh water up-slope (towards east) while being more salty down-slope. Water salinity also increases downward deeper in the aquifer. The aquifer is likely to be confined since it is covered by a clayey horizon which diminishes eastward.

In the second section (Fig. 9B) the general shape of the syncline can be noted. Two main horizons are present other than the uppermost horizon which represents Quaternary deposits. A clayey horizon increasing in thickness towards northeast is covering the aquifer again making it confined. The boundary between fresh and saline waters is roughly marked.

2-Four other local geo-electric sections were constructed in four localities. These are in the villages [Malik Agha (VES's 8, 8A and 8B), Chghlok (VES's 11, 11A and 11B), Said Obied (VES's (14, 14A and 14B) and Chilhaweza (VES's 18, 18A and 18B) (Figs. 10A and B and 11 A and B respectively).

Three of these sections show the presence of salty water (Fig. 10A and B and Fig. 11A) while the fourth section indicates the presence of fresh water in the aquifer (Fig. 11B). This latter section represents the locality

18 (Chilhaweza village) which is situated on the crest of the Avana Anticline. Figures 10B, 11A and 11B show that the aquifer is overlain by clayey horizons. The section in figure 10A is constructed depending upon some cropping out rocks which belong to Lower Fars and Upper Fars Formations.

9-Conclusions

Daibega simple hummocky plain was surveyed using the resistivity method by taking (26) VES points. Data was interpreted qualitatively and quantitatively. The results were integrated with some previous hydrogeological data. The following points are concluded:

1- Twelve different sounding curve types were obtained representing four to six horizons (Table-2).

2- Estimated water table depths are in acceptable consistency with those obtained from the water wells (Figs. 4 and 8). This depth is less than 50m in the central parts increasing towards north and south to reach about 80m.

3- The high resistivity values of aquifer rocks are located in the area north of Mekhmoor town occupying the central parts while the lower values are occupying the central northern parts (Fig. 5).

4- Aquifer water resistivities are distributed in three zones of high values. They occupy the northwestern areas while values decrease in the southeastern areas (Fig. 6).

5- Six geo-electrical sections were constructed. Two of them cut the Daibega plain and the Avana Anticline respectively while the other four are local in four different sites (Figs. 10 and 11). The (regional) sections show an invasion of salty water in the down-slope direction.

Among the four local sections the locality 18 (Chilhaweza village) gives indication for the presence of fresh water. This site is located on the crest of Avana structure.

10-Acknowledgments

The author greatly thanks Dr. M. Tamr-Agha (the professor of geology in the department of geology, Salahaddin University, Erbil) for reviewing the manuscript. Also thanks are due to Mr. Rezgar Zrar and Mr. Hawri Abdulla (geologists-Erbil) for their valuable helps in data acquisition.

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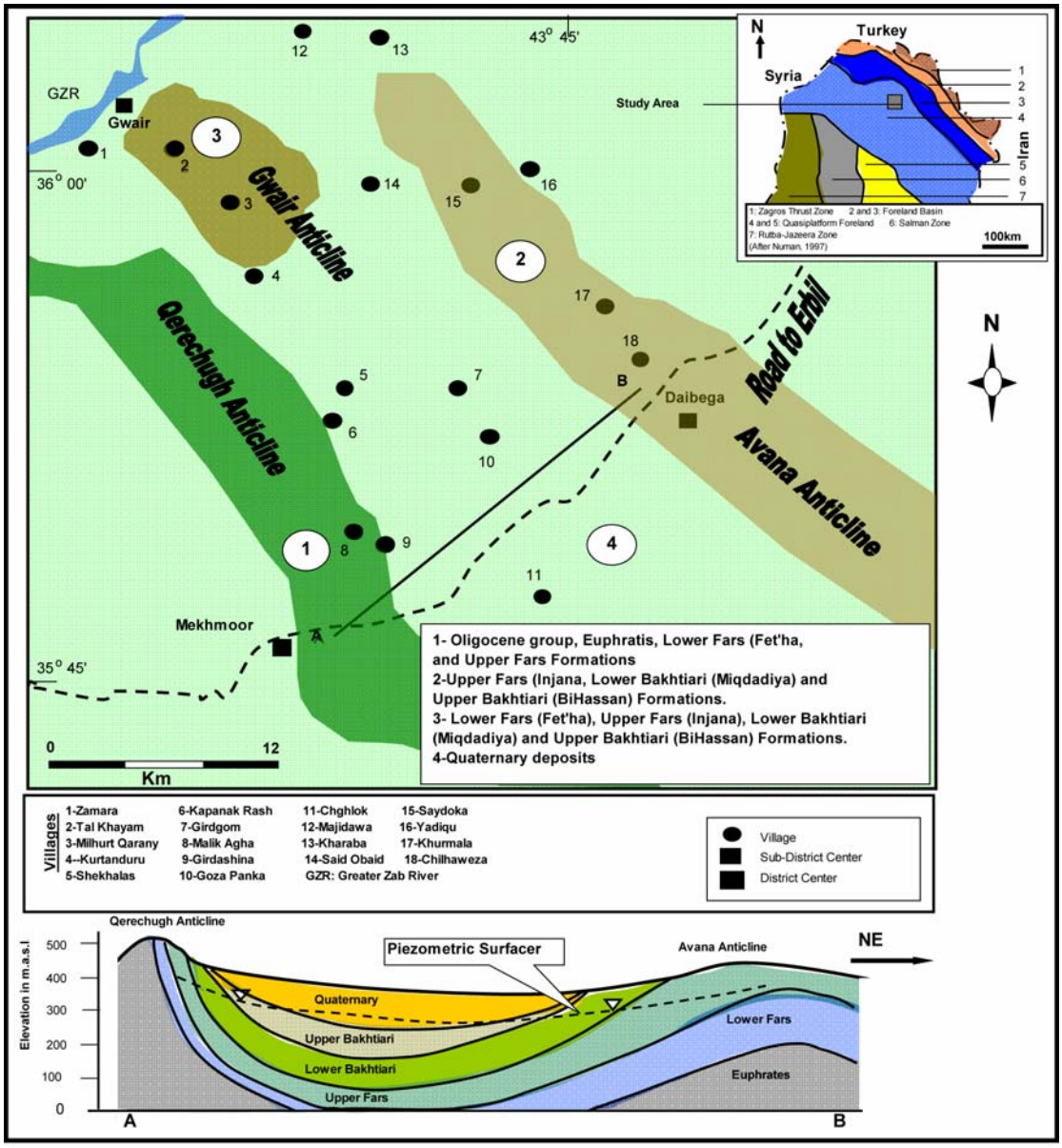

Fig. 1: Geological Map of Daibega Area, Cross Section Across the Plain (Cited and modified after Al-Sudany, 2003) **and Tectonic Map of Iraq Showing the Location of Daibega Area**

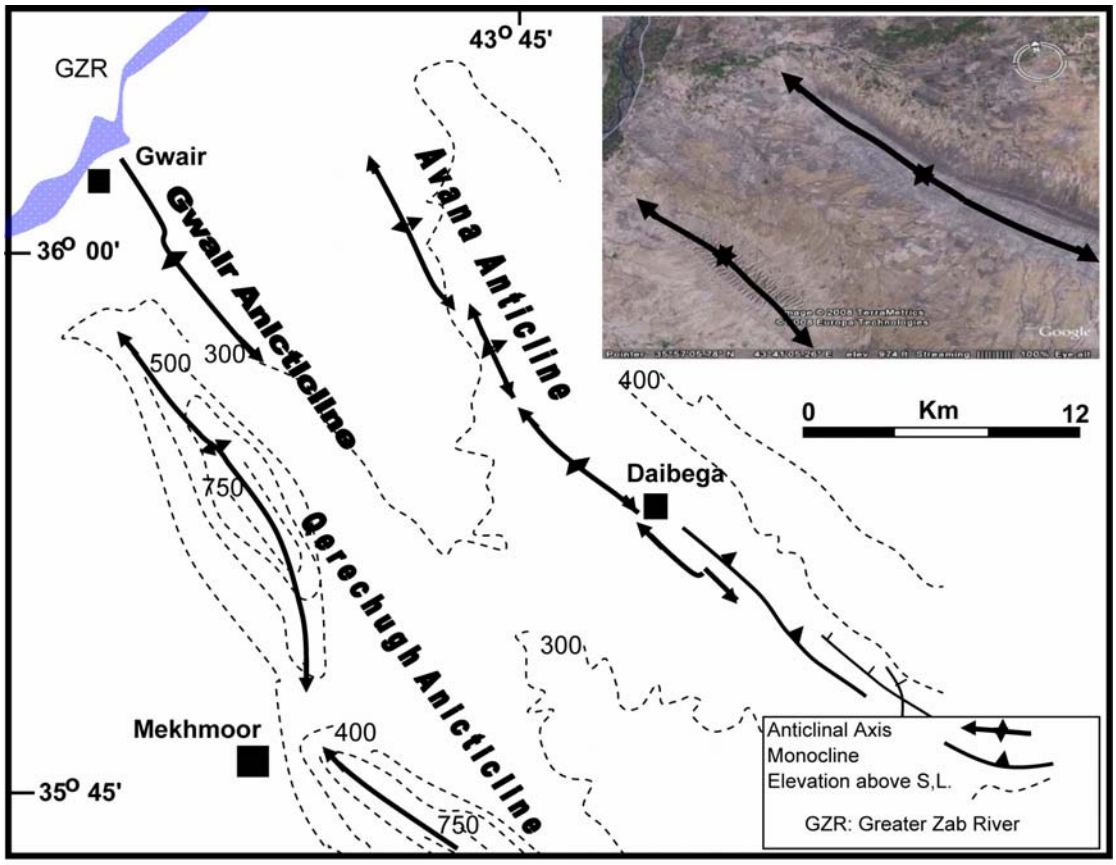

Figure 2. Tectonic Map of Daibega Area

(Cited and modified after Al-Sudany, 2003)

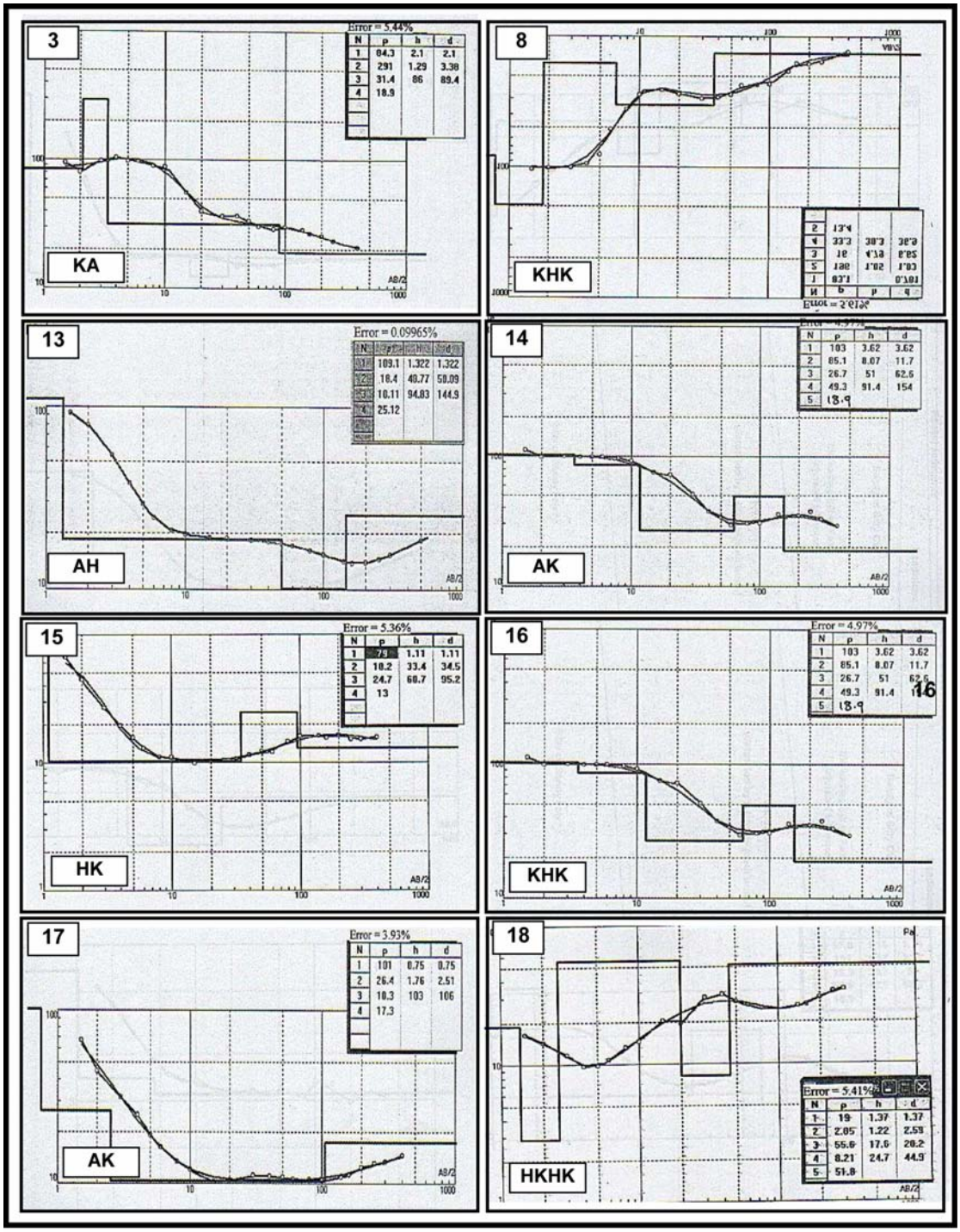

Figure 3. Some Examples of Field Curves and their Interpretation Results

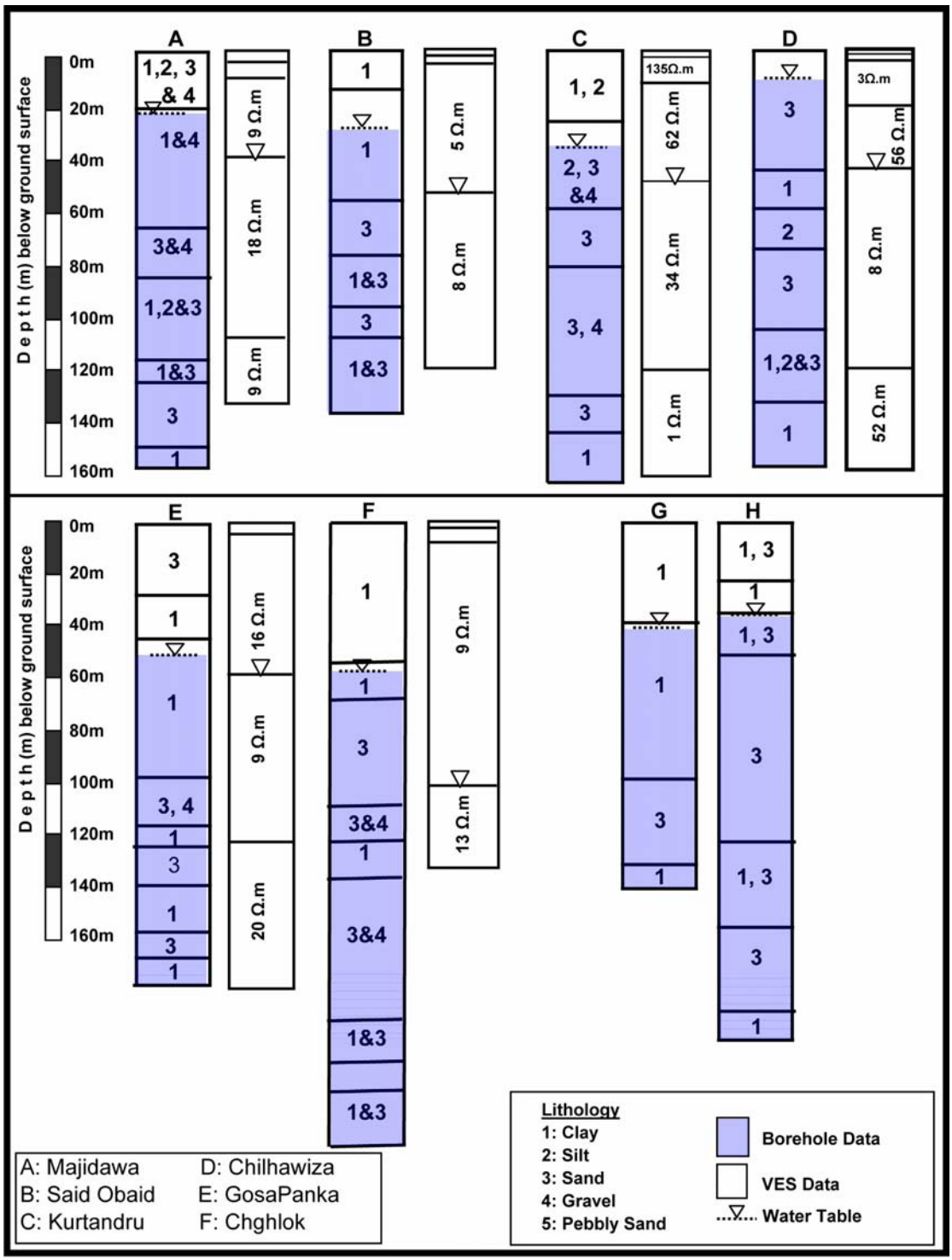

Figure 4. Borehole Stratigraphic Columns as Correlated with VES Results.

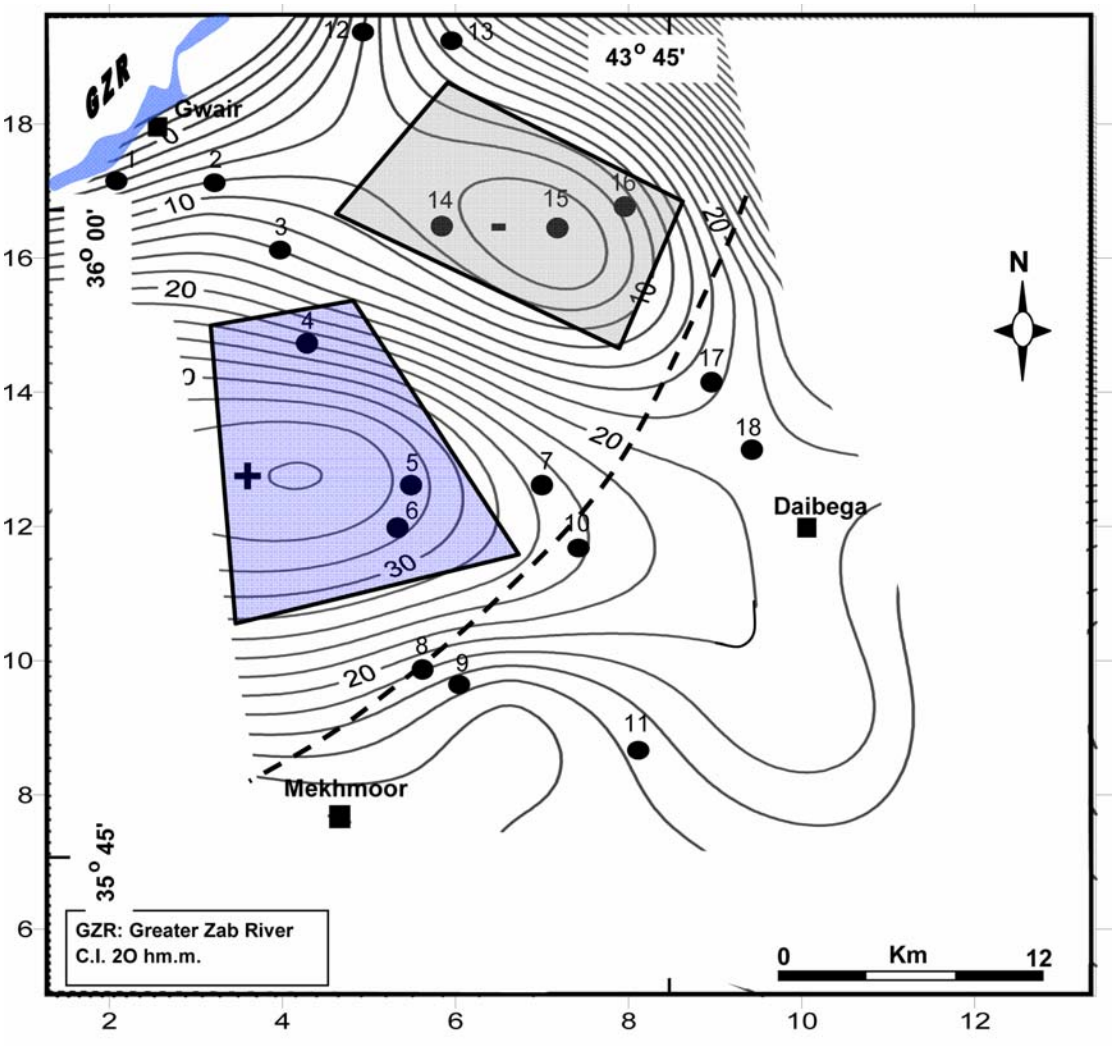

Figure 5. Iso-Resistivity Map of the Aquifer Rocks.

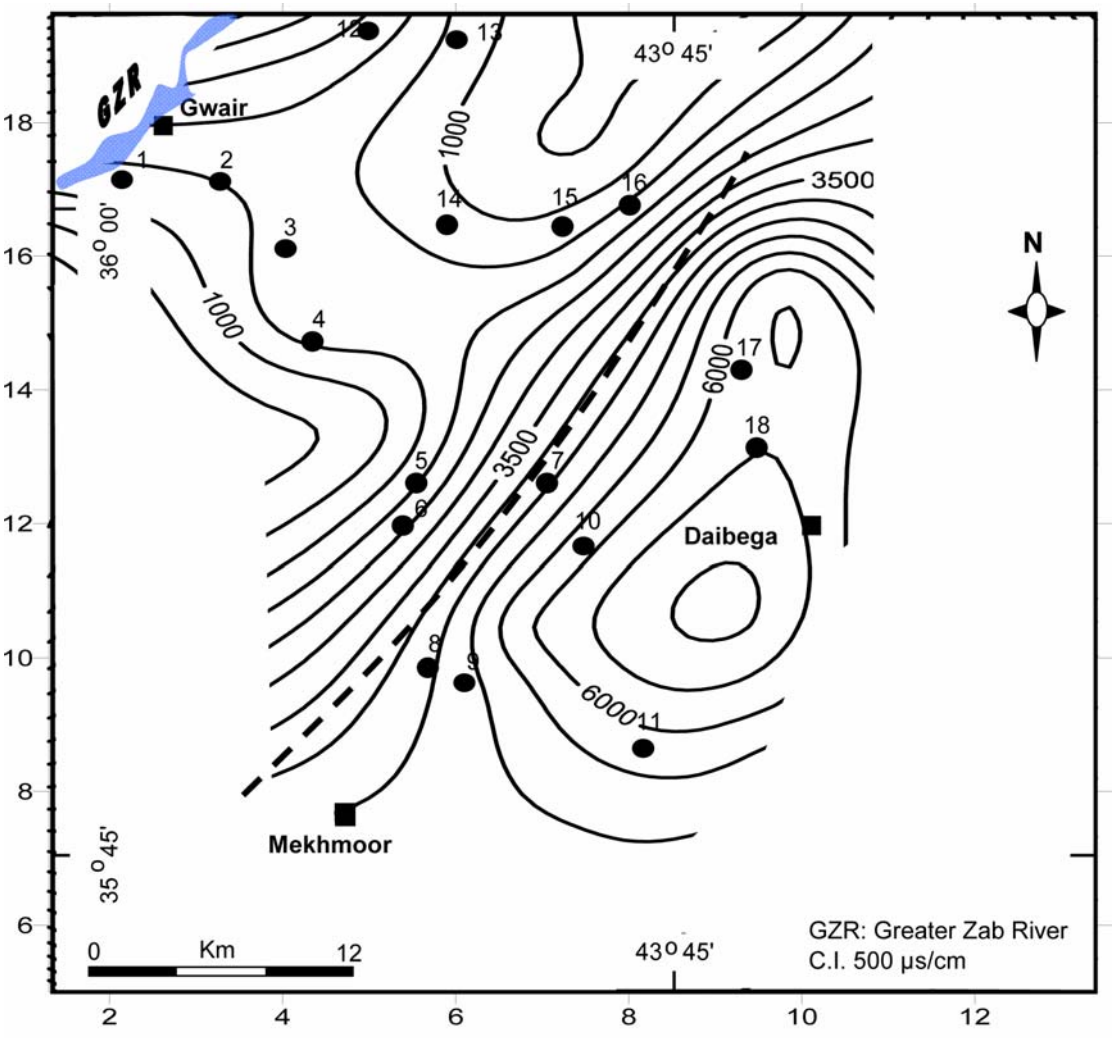

Figure 6. Iso-conductivity map

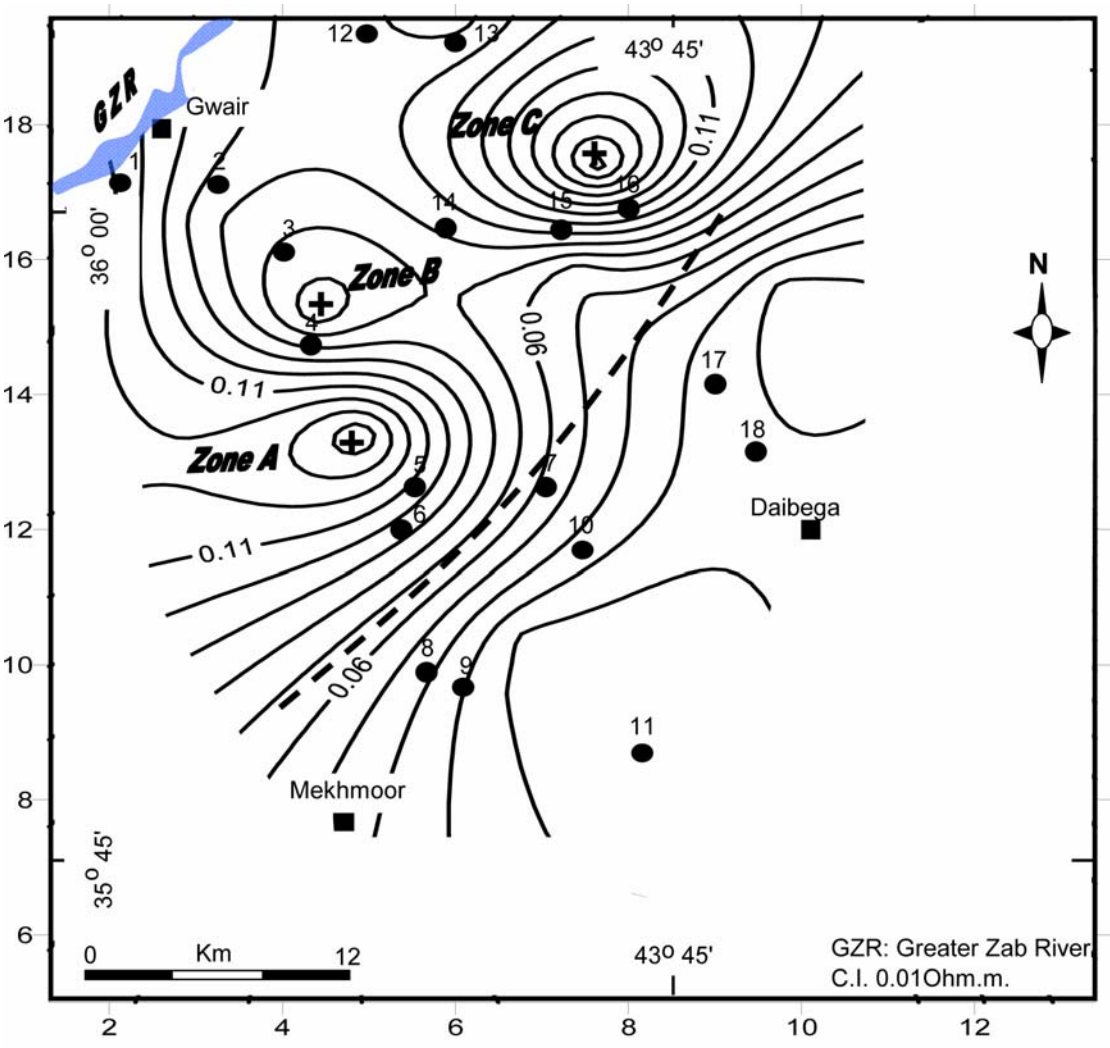

Figure 7. Iso-Resistivity Map of the aquifer water

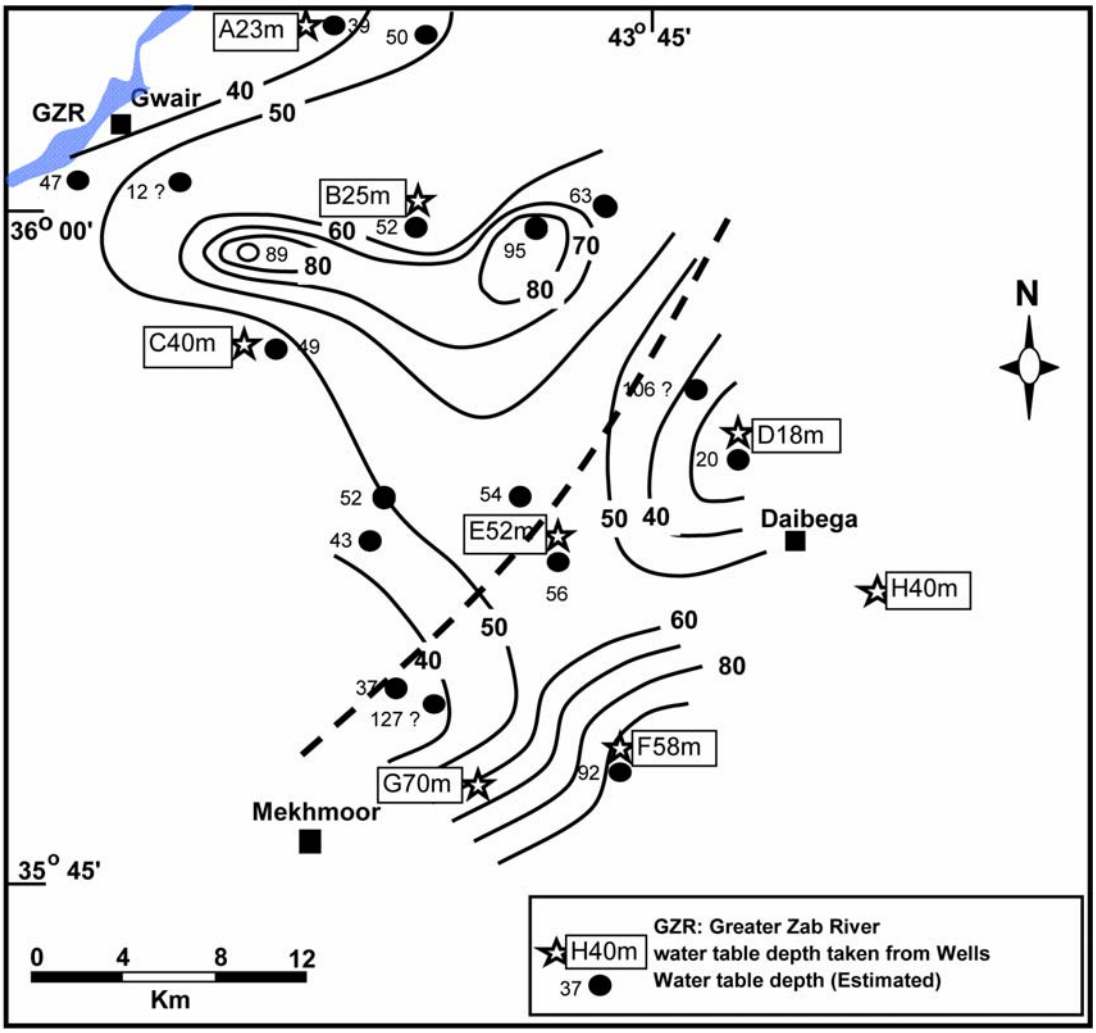

Figure 8. Water Table Depth Map Estimated from Resistivity Data

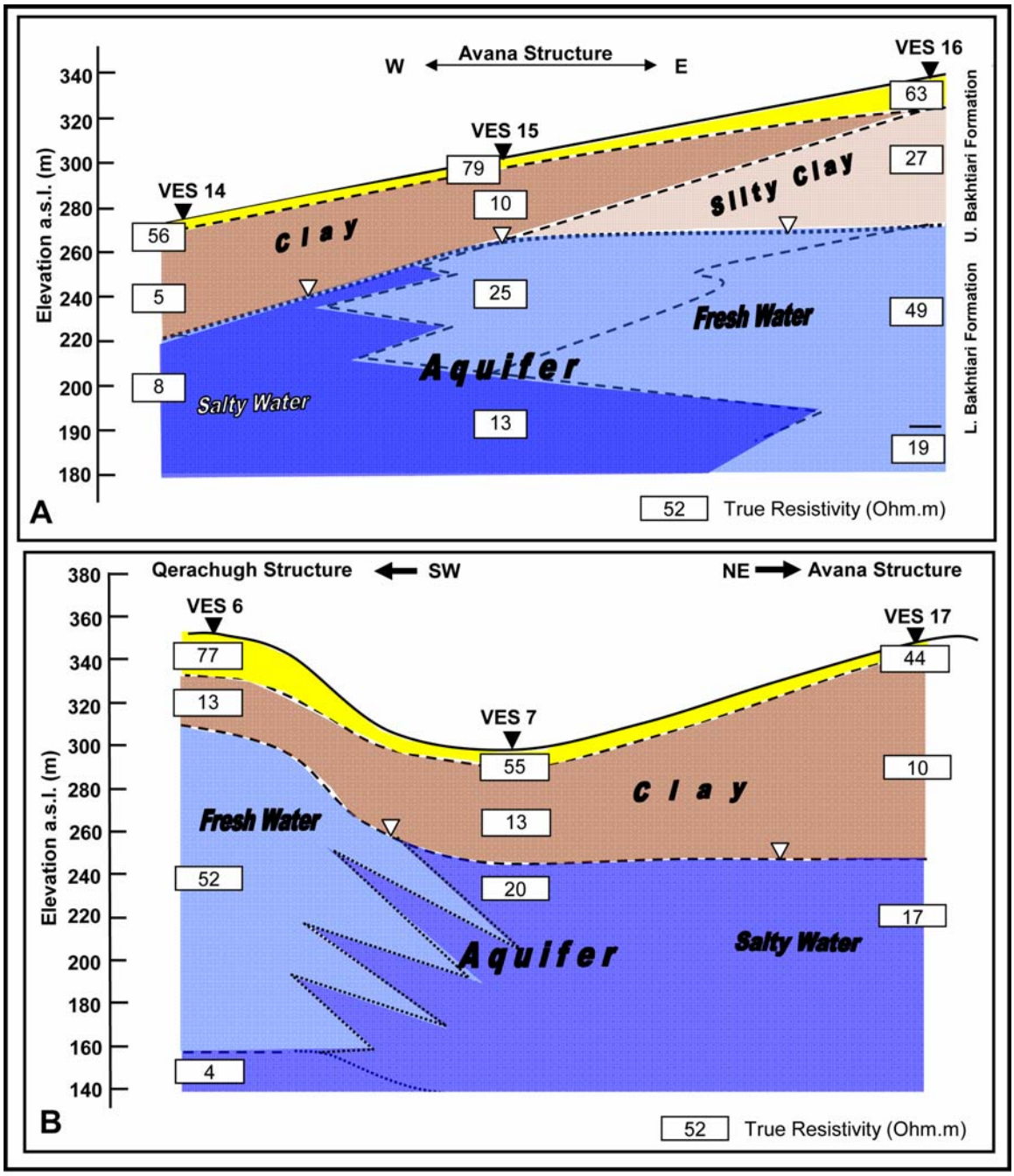

Figure 9. Geo-electric Sections Across the Avana Structure (A) and the Daibega Plain (B).

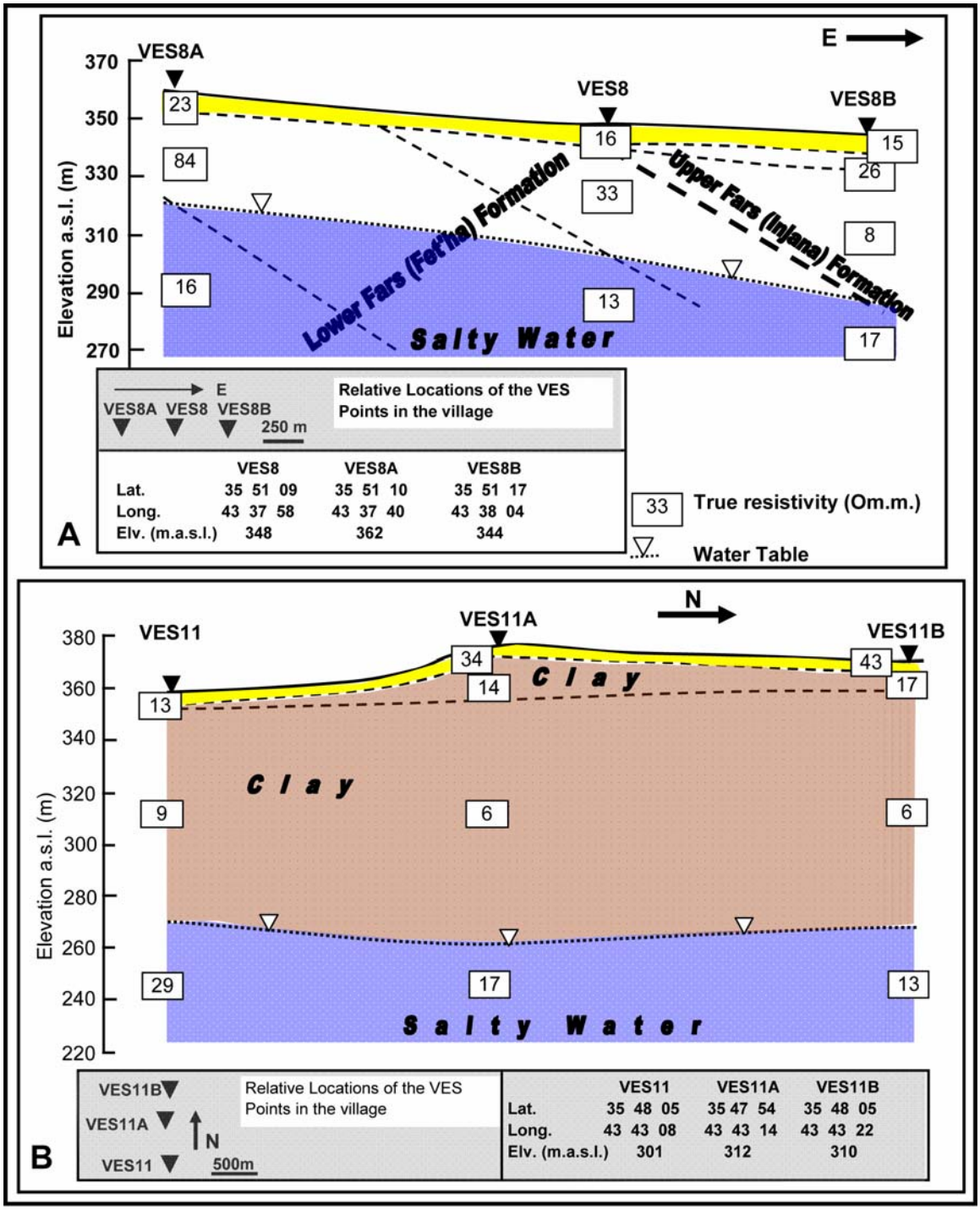

Figure 10. Geo-electric Sections in Malik Agha (A), Chghlok (B)

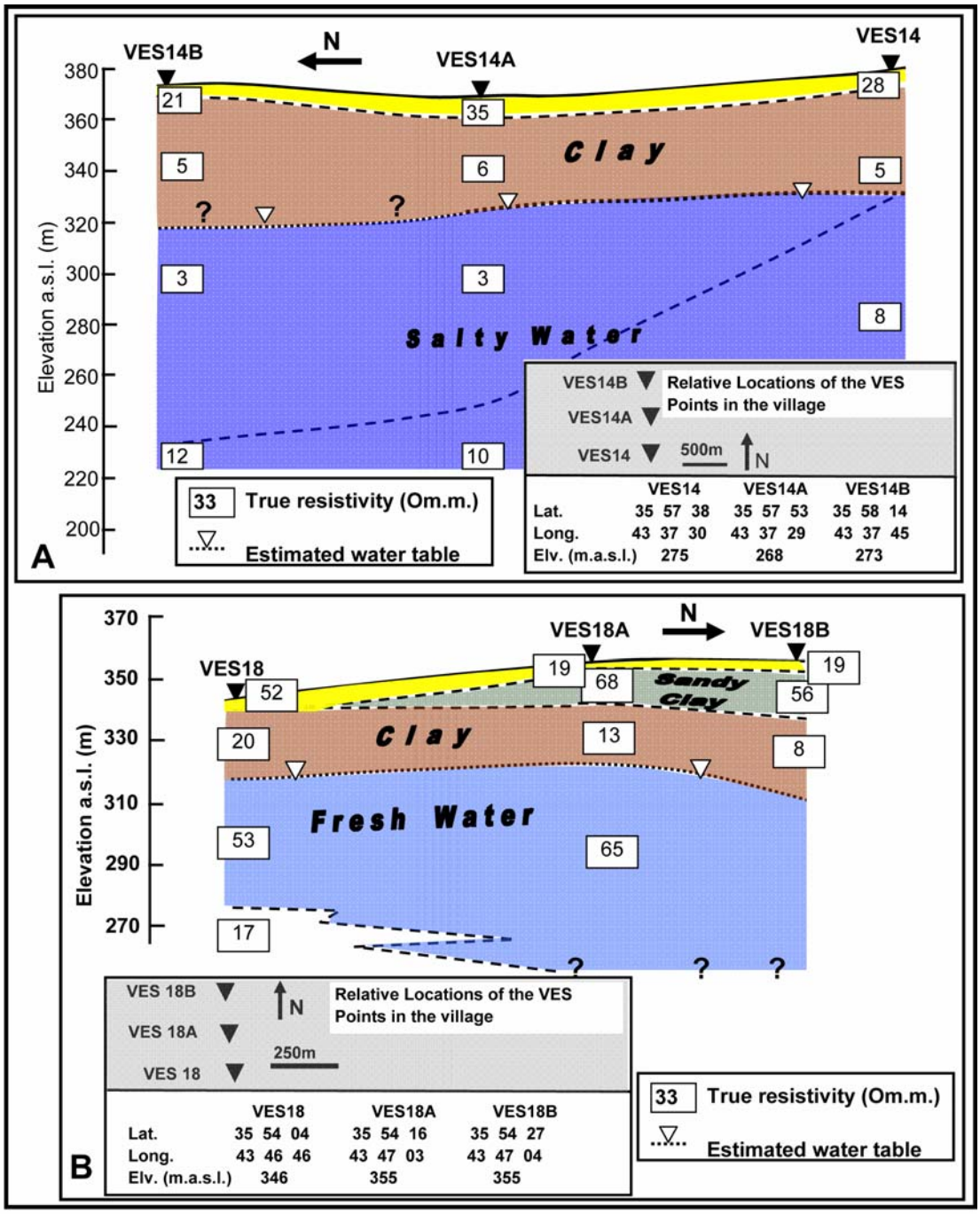

Fig. 11: Geo-electric Sections in Said Obied (A) and Chilhaweza (B)

对社会经济形态的改变和人类社会发展的新观念 新 6/08

-----社会生产的主要动力形态的改变导致生产关系和社会经济形态的质变----

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内容提要: 任何活动物体总需要动力.所谓 “生产力”中的所有的工具, 机械或者工作系统都需要与之相适应的动力(即原动力或驱动力). 动力是生产工具的心脏, 生产工具因有动力(能源供应)才有做工的能力,而生产力又要求一定的生产关系与之相适应. 科学技术和生产工具的进步只是社会生产和经济的量的发展和进步. 社会生产力的主要动力的改变才是直接的质的飞跃,并对生产关系的改变起了决定性的作用,从而导致人类社会经济形态和生产关系的质变.而所谓生产力决定生产关系,其实质就是社会生产的主要动力形态决定生产关系.因此,人类最重要的任务就是不停地找出新的动力(即能源)和相应的动力装置以满足新机具新技术和技术革命的需要.本文的新观念或者说主要特点是论证人类社会发展的现有的五大历史阶段基本上是由社会生产力的主要动力形态的不同本质的所决定的.

.然而,社会发展却是曲折或螺旋式的上升,因为社会发展还同时受到人的精神动力即欲望的影响和干扰,特别是统治者的思想意识和欲望所制订的政治制度的重大影响和干扰.其它诸多因素,如,经济体制,政治体制,文化传统,宗教和自然环境等等对社会发展或阻滞在一定时期内也起着相当重要的作用.但这些都不可能使生产关系和社会经济形态产生质变.综观当今天下大势,在科学技术和生产动力已高度发达和各种资源相对愈来愈少的当今时代,要想使人类社会整体继续发展前进,就需要狠抓两头,一方面大力发展科学技术特别是研制出新的生产动力,另一方面,要建立有效的民主的分权和监督制度以抑制权势首脑的恶性欲望的膨胀.
[New York Science Journal. 2008;1(3):38-44]. (ISSN: 1554-0200).

本位原文为英文,发表在 “The Journal of American Science. 2005;1(1):” 杂志上,该杂志的网址: http://www.americanscience.org/journals/am-sci/0101.本译文有许多重要的增减和修改.

关键词: 社会生产的主要动力, 社会经济形态, 生产关系,人类社会的发展,生产中的动力形态,人类的欲望.

1.简短介绍

人类社会过去是如何发展的? 什么是推动社会前进的动力? 主要是什么东西的改变决定了生产关系的改变?

在人类历史中,社会的重大发展和进步表现为社会经济形态的质变.然而,社会经济形态基本上是由全社会的生产的主要动力形态所决定的.再好的技术,如果不能配备与之相适应的动力装置以用之于生产,它就不能成为推动经济持续发展的生产力,更不用说改变社会经济形态了.在古代,最重大的技术莫过于杠杆和轮子.杠杆原理是阿基米德在公元前二世纪发现的.二者被不自觉地运用于古代,造就了伟大的奇迹:埃及的金字塔和中国的长城.然而,由于古代杠杆和轮子是由人力作为动力,所以它们不能变为社会的主要生产力,而在原始的几千年内无法改变社会生产关系和社会经济形态,只能起增大人的体力的作用.社会生产是一个复杂的过程和系统,各个环节往往需要不同的工具,装备和机器,但它们往往使用相同类型的动力.因此,社会生产中的主要动力的改变就必然导致生产关系的质变和人类社会经济形态的改变.

下面将具体地说明在人类历史中社会生产的主要动力的改变是如何主导生产关系的质变和人类社会经济形态的改变的.

2. 原始公社或原始社会—没有人工生产或产品, 人们主要的工具是自己的双手,动力是自己的劳动力.

在原始公社或原始社会,人们只有最简单物件,例如石头,树棍等,人们收藏这些东西以便抗击野兽,采摘野菜野果树叶以维生和御寒. 人们主要的工具是自己的双手.人们的行为除了有较多的意识交流外,与野兽并无太多区别.人们无法大量储存食物,因为天然的食物易腐烂.因此,在没有剩余物品的条件下,偷窃,掠夺,压迫就很难发生.况且人们还要共同防御天灾和野兽,抚养和保护幼婴.因而关系密切人们只能组成公社以便互助.在公社内部,人与人之间的关系在对待灾难只能是互利互助.在猎取私吞食物时大概是自私甚至掠夺的.人类从直立行走以来就维持这种公社的群居生活达几万年.

原始公社可能由于发生两个重大事件后而走向分解;火的运用和保存以及畜牧的成功;火扩大了人类的

食物范围,使人们可以食动物的肉,许多的果实和植物.这些营养丰富的食物反过来有增强人类的体力和智力.尤其是被饲养的动物是能长期保存的食物,它也可被当时尖锐的石器宰杀而随时供人们的需要.那些能被长期保存的牲畜果实等食物于是成为可供他人需要的剩余物品.在原始公社内部,随着剩余物品的出现,偷窃, 掠夺,压迫,奴役,弱肉强食等也就随之而来.接着就会造成公社的解体.

3. 奴隶社会—畜牧业社会, 奴隶的人力成为社会主要生产的动力, 奴隶也成为奴隶主的生产工具和财产, 当时铜器的发明和作为战争的武器应用推动了奴隶制的发展..

一旦许多原始公社喂养的大量牲畜成为剩余物品时,在一些人的心中就会产生贪婪的欲望,在原始公社内部,首领和强壮者就可能掠夺,压迫,奴役弱者,当一个强大的公社在战斗中打败一个弱小的公社时,整个被打败的弱小公社的人们就会成为俘虏和奴隶. 当时铜器的发明和作为战争的武器应用推动了奴隶制的发展.有了从不断的战争中所得到的大量俘虏作为奴隶, 奴隶制度才得以维持.[1]这就是古代奴隶制离不开战争的原因.因此,奴隶成了真正的生产力,同时奴隶本身又成为奴隶主的财产和工具,而**奴隶的人力就成为真正的生产力的动力**.奴隶也成为奴隶主的会说话的牲畜,在奴隶制的初期,那些弱小的俘虏也会像牲畜一样被宰杀后分而食之. 由于大量奴隶的被迫的强制劳动,为奴隶社会创造了大量的财富,养活了所有的奴隶主,王朝官员,和知识分子.而正是他们中的一些人在奴隶社会创造了灿烂的文化和一些科学技术.为保护奴隶主利益的统治者就成为掠夺,压迫,奴役奴隶的工具.奴隶主对奴隶的残酷压迫必然会引起奴隶的反抗暴乱,但**这种反抗暴乱最多只能暂时减轻奴隶主的压迫,而不可能改变奴隶制度**. 当在奴隶社会,主要的生活资料和财富都来源于奴隶的劳动以及所喂养的牲畜时,**只要奴隶作为生产工具和生产的动力的作用不改变,而不能为其它的有效的工具和动力所替代时,同时只要社会的主要生活是来源于畜牧业时,奴隶制度就不可能被推翻或被替代.** 在奴隶社会,随着农业的规模从小到大的发展,丰富的农产品比奴隶制可以为全社会提供更多更好的生活必需品.一旦奴隶社会中农产品成为生活资料的主要来源,农业成为社会的主要经济时,地主阶级就会用和平收买或暴力的手段从奴隶主阶级手中夺取政权,而在社会中占主要地位的旧的奴隶生产关系最终将逐渐地被新的地主-农民生产关系所取代,从而使地主-农民生产关系发展壮大成为社会的主要生产关系,整个过程是新生产关系发展壮大和旧生产关系同时缩小被逐渐取代的长期过程,而不是旧生产关系被新生产关系通过几次暴力和革命打败而后被彻底消灭.

4. 封建社会—农业社会,畜力和农民的人力成为社会生产中的主要动力,在农业生产中,农民驾御着比人力强大数倍的畜力以从事人力所作不到的耕耘活动.铁器的发明和使用更大大地促进了农业的发展.

为什么封建的生产关系必然会代替奴隶生产关系呢?第一,农业生产能为全社会提供更多的生活资料,有更高生产率,畜力比人力强大数倍,而能作人所不能作的重农业劳动,如耕田,运输等.结果,农民的劳动减轻了, 农民成为耕牛的驾御者.第二, 农业使农民和所有人口都能安居下来从事生产.第三,农产品可以长期储存而随时供人们的需要.第四,农民比奴隶自由得多.**社会发展的规律总是高生产率和更自由的生产关系取代低生产率和少自由的生产关系.**如此,人类的生产和生活才会进步和提高,人们的欲望才能得到更大程度上的满足.然而,封建统治王朝和地主阶级的贪婪必然会残酷的剥削压迫农民而造成农民暴乱.但在中国古代,两千多年来,无数次的农民暴乱只能造成封建统治王朝的改朝换代,从而暂时减轻对农民的剥削压迫.但封建生产关系仍然不能被推翻或被取代,**因为农民暴乱根本不能提供新的更强大的生产动力和更高生产率的生产关系.农民暴乱过后,农民照常用牛耕地主的田,农业仍然是社会经济的主体,封建的生产关系依然如故.**

八百多年前, 在中国宋朝,一些工业和手工业已很发达,像采矿业,炼铁炼钢等技术已相当先进.[2]六百多年前,在中国明朝,太监郑和 [3]曾率领庞大的舰队七次巡游南洋和印度洋,他的舰队一次就达到将近 30,000 人和 300 艘船舰.而造纸和印刷术则早已发明和成熟.明朝的火药和红衣大炮以威力巨大而出名.铁制农具,如犁,耙等虽然对农业生产的发展起了巨大的促进作用,但所有这些技术除了以畜力和辅以人力为动力外,别无选择.为什么工业革命和资本主义数百年来不能在旧中国出现?不管那时在旧中国某些技术如何先进,但是这些技术只能靠人力驱动,而没有其它的更强大的动力.而畜力也只能供农业和运输之用.郑和庞大的舰队的动力也只是人力和风力.炼铁炼钢的鼓风机和印刷也靠人力.**如果没有其它的更强大的动力的发明和应用,农民用畜力耕田就改变不了封建制度,虽然也有锋利的铁器,但资本主义也不可能生长发展,不管封建社会里农民暴乱如何地剧烈和频繁.**

在中国大陆,由于广大的江河平原和气候雨量等条件适合于农业,长江和黄河及其支流流域有广大的平原和盆地,众多的湖泊,气候温和,雨量充足,适宜于农业和耕种, 所以在中国古代,农业发展得很早而广泛,很早就成为社会生活的主要来源,这种小农自给自足的经济就是中国数千年来封建制度长期存在的天然环境和基础.而畜牧业因无大草原,所以很难甚至于一直就没有成为河流纵横的中国大陆的社会生活和经济的主要来源,这就是奴隶制度在中国大陆古代很短

暂甚至于发展不完全,不成为主体的主要原因.这就是**亚细亚生产方式之所以存在的主要原因**.反之,由于蒙古有大草原和乾寒的气候,只能适合于畜牧业而不适合于农业,生活和经济长期以畜牧业为主,所以蒙古也只能长期实行奴隶制和半奴隶制.

再看,中国西藏位居高原,由于社会的主要生活来源于畜牧业,而农业只居次要地位,所以那里的农奴制一直维持到解放初甚至到 1960 代.同样,许多居在中国西南山区的少数民族因为在山上无法利用牛耕田,只会刀耕火种,所以农业不能发展,生活要依靠狩猎和果实.这就是他们长期维持半奴隶半封建制度直到解放后的原因.

蒸气机在欧洲封建社会的末期为人类带来了非常强大的动力,使资本主义的萌芽在欧洲发展到工业革命.毕竟笨重的蒸气机只能运用于少数工业部门,如船舶,火车,矿山等,而不能用到农业上.内燃机的发明和广泛应用使各个工业部门以至农业都有了强力动力.于是社会生产力和生产率都有高速度的提高,资本主义的生产关系在社会中迅猛发展开来.一旦资本主义的生产成为社会经济的主体,成为社会财富的主要生产力量时,资本家为了保护和获取更多更大的利益和权力,一定会取代代表地主阶级利益的封建统治王朝而实行资本主义的统治,他们取得权利的手段不外乎两者,一是和平的收买如英国和日本,台湾等,一是革命,如法国中国等.在封建社会的末期,资本家和地主的矛盾主要表现在两个方面,第一,早期的资本家需要从地主手中抢走许多农民使他们变为工人,而使地主的利益受损.第二,一些帝王,贵族,大地主为了维护自己的既得的利益和尊严往往瞧不起资本家进而压制他们.

5.前资本主义社会—工业社会,工业革命时代;蒸气机,内燃机,发电机和电动机成为强大的社会生产的主要动力,这些强大动力的普遍应用最终会导致农业的机械化和电气化而使整个资本主义社会走向全面的工业化和电气化,并使发达国家终于基本上消除了三大差别:即地区差别,工农差别和城乡差别. 这就为进入后资本主义提供了社会经济基础.

一旦代表资产阶级的政权在一个国家取代代表地主阶级的政权,社会就正式的进入资本主义社会.在资本主义社会时代, 蒸气机,内燃机,发电机和电动机的发明和广泛应用是伟大的技术革命.而各种形式的能源(热,光,电,化学,机械功,等等)之间能相互转换和能量不灭定律的发现和应用是此时期技术革命的最高成就.由于**农业的分散性,无法集中生产,而人力价廉又灵活多样,因而农业生产是最难以工业化的.只有农业生产在走向工业化和电气化后, 资本主义社会才算进入了现代化社会—完全的工业化和电气化.只有电能和作为动力的电动机才能方便地进入到全社会的每个角落—家庭,办公室和野外.** 如是,人们的生产,工作和生活就变得轻松和更舒适了.社会的劳动生产率随着这些强大而无处不在动力的应用于各种技术和机具而空前的提高了.高生产率的人类社会在百忙之中在 20 世纪诞生下一对 “双胞胎”— “人口爆炸”和“知识爆炸”.因而也造成了对世界资源和市场的争夺战.资本主义生产和社会的迅速发展在 20 世纪一百年内已超过人类社会过去数千年的发展,但也给人类带来了两次世界大战.**从 1950 代 到 1990 代,许多发达国家,如美国,日本,法国,德国,北欧诸国等,已经进入资本主义社会的末期,在全国工业化和电气化后,这些国家的社会经济形态,社会结构,政治制度和生产关系等都发生了本质的转变**

(1). 工人和农民的人数少于全国总人口的 30%, **中产阶级已构成社会的主体,他们中大部分人除了自己工作(受雇或雇人或独立工作)之外,还有广泛的投资,这是社会政治经济稳定的基础.**在法律的保护下,人人有基本的平等权利,因而工人和资本家集体之间的矛盾,贫富集体之间的矛盾等等都变成为非对抗性的.

(2).全民的福利制度保证了每个人基本的平等权利,如每个人的出生,生存,生活,受教育,健康保险,失业救济等等.每个人从生到死都保证了基本的尊严.另一种对社会低阶层有利的制度是实行累进税制.这些所谓的优越的社会主义成分都被近代的发达资本主义国家完全吸收和实现了.社会主义原来的主旨也就是对社会财富的公平合理的分配.没有一个人或一种理论正确地指出了资本主义以后的社会是一个什么样的社会.

(3). **在发达国家,基本上消除了地区差别,工农差别和城乡差别,这种全国平衡的经济发展是全国政治稳定的经济基础,也是民主制度得以顺利实行的基础.**

(4). 由于科学技术的快速发展使社会劳动生产率大大提高,人们化在生产生活必需品的劳动和时间只占社会总劳动和时间的小部分,人们就有财力和时间去享受物质和精神生活.大部分人都有剩余的财力去投资或创立自己的事业.社会中老板和雇员的可互换性使得老板对雇员的剥削适可而止.在发达国家,技术工人不是贫困阶层,而是属于中产阶级.

(5).在反垄断和反歧视的法律保护下,市场经济的公平竞争机制为社会经济的增长和个人才智的发挥提供了较平等而有利的条件.

(6).司法的独立和高度的普遍的民主制度消除了大规模的长期的社会动乱和内战的危险,保障了社会安定和正常生产生活秩序,也保障了个人的正当权益和自由.

(7). 阶级斗争的观念不再为全国大多数人所信仰,健全的法制使人们和阶级间的冲突能通过协商和法律手段来解决.

6. 后资本主义社会—基本上消除了三大差别:即地区差别,工农差别和城乡差别的社会,开始进入知识经济和信息社会.随着生产力的继续高度发展,资产阶级和工人阶级的矛盾将逐级减弱,而管理阶层与被管理阶层的矛盾逐级增多.一方面,各种各样的工作系统的动力需要微型化,精密化和高度自动化, 这是信息社会和智慧经济时代的必要条件.同时,由于对能量的新的巨大的需求,具有庞大动力的装置也是必需的.在发达国家中的后资本主义社会虽是资本主义私有制,但其分配却包含愈来愈多的社会主义成分,其较普遍的民主制度基础是建立在基本上消除了上述三大差别.

在资本主义社会的末期,在发达国家完全工业化和电气化的结果,生产的动力已经强大和多样化到足以免除人们的繁重的体力劳动.人们已经成为机器的操纵者和生产过程的控制者.在发达国家,脑力劳动者已构成社会的主体,没有一个人整天从事单纯的体力劳动而完全没有动力机器的帮助.**在资本主义的下一时期—后资本主义时期,人们的主要任务就是在高智能和精密技术的帮助下, 尽可能的减少和取代繁杂的脑力劳动,**(例如代替,扩大和延申一些感觉器官的作用,记录和处理数据和信息,作复杂的数学和数字演算,记录和操控各种生产和工作过程,用机器人代替人的一些劳动和工作,等等),**并尽可能的提高体力劳动的工作效率,缩小体力劳动和脑力劳动的差别,**为所有劳动者节省大量的时间和精力,以便他们都能有更多的个人自由时间去实现自己的梦想和满足自己的欲望. 那些具有微型和精密动力装置的各种新技术在过去 30 年内使资本主义国家发生了本质的变化.另一次人类的伟大的技术革命--信息革命已经在发达国家产生,它将导致全社会走向自动化,信息社会和智慧经济时代,即后资本主义社会.

人类过去曾经成功地将热能,光能,化学能,机械功,太阳能,水能,风能,原子能等等通过机械设备转变为通用电能 (GE),而且 GE 也可顺利实现转回上述各种能.然而,电能有各种不同类型,他们的特性是大不相同的,诸如,高压电和低压电,大功率和小功率和微功率,交流电和直流电,有线电和无线电,高频电和低频电和其它各种频率电,等等.各种不同于通用电能 GE 的电称为特殊电能 SE,将 GE 通过不同装备转变为其它的 SE 作为动力, 有的容易做到, 有的是很不容易做到的,它的成功可成为一些重大的技术革命.在电脑中,不能直接应用 GE 作为动力, 而信息传递所需要的微型精密动力装置是应用了许多种高频率脉冲器,包括高频率发生器和高频率放大器等等,它们都是 SE.,是重大的新技术.在 1960 代,由电子真空管组成一台电子计算机可以装满一大间房屋,然而其功能却不如现在的一台落后的个人电脑.新旧技术之间的重大差距就在于其 SE 的不同频率和不同频率的脉冲发生器.这表明不同技术的动力和动力装置,其效果是完全不同的.同时,**信息本身就是能量,信息的传递就是特殊的有记号的能量的传递.**

所以,**任何新的重大技术往往需要新的动力和新的动力装置, 它的出现和广泛的应用定会改变人类社会的生产方式, 经济形态和人们的生活方式.**

当人类剛进入 21 世纪时,发达国家也剛进入后资本主义社会,研究和发现新技术所需要的动力 (能源),并制造出新动力装置依旧是科技学者永久的重大任务. **新科学技术正向宏观世界和微观世界的两极发展.**[5] **随着这种趋势,新动力也从两方面去寻找: 超强动力和各种不同类型的微型动力.只有超强的动力才能带给人类新的超强力量,新的微型动力将带给人类新的智慧.**二者是人类未来发展的一双翅膀,缺一不可.第一,造成新的智能工作系统和新技术所需的微型动力装置总是首要任务.一台电脑或一个智能工作系统是一个很复杂的许多机具的组合,它的不同部件需要许多不同的高频率脉冲装装置(SE)以及特殊的半导体材料.例如,应用于电视广播,无线电通信和电脑上的动力 SE,动力装置的结构和材料等都是完全不同的,虽然那些 SE 均来源于同样的 GE.**这就表明任何一项重大的新技术或新智能系统都离不开某些新 SE 及动力装置.** 第二,必需有新的超强动力(能源)以替代即将在几十年之后用尽的旧的自然能源.加之星际航行也需要新超强动力.因此,寻找出超强动力和制造出相应的动力装置总是人类社会继续发展的必要措施.能源之于社会正于食物之于个人.

信息革命已经缩短或者几近乎消除了人与人之间的时空距离,大大地扩大了人类的思想,工作和活动的空间和能力,大大地节省了脑力劳动者的工作时间,改变了人们的生活方式和他们之间的关系.愈来愈多的人们能用个人电脑在家学习,工作和作生意.世界各地的人们可用互联网交换信息,知识,经验,交朋友和相互促进帮助,因此可能通过互联网改变思想观念和实现自己的梦想.但另一方面,信息技术的发展已导致国家和公司之间对搜罗高科技人才的强烈竞争.个人之间对知识技术的竞争已成为公开的,刺激的个人对财富,名誉,地位和个人成就的激烈竞争.

在发达国家,由于生产的高速发展和社会的进步,个人的生活水平大大提高和个人自由时间大大增多,随之而来,各人欲望也大大膨胀.人们除了为个人财富和事业奋斗不息外,还要为个人的健康,长寿,享乐甚至于美容而奋斗.这些国家的高速和过度发展已经产生了一些重大的经济的社会的,文化的和道德的问题,这些问题都是由人类欲望的恶性膨胀而来. (A).个人自由是建立在私有制和民主制的基础上的,它导致个人欲望和自私自利的个人主义的膨胀.结果,富人的贪婪和穷人的懒惰成为阻碍社会经济发展的两极,而大量的个人犯罪成为难以消除的社会癌症. (B).由于发达国家内的民主制度是以维护个人利益和个人自由为

目的的,从这种环境中生长和竞争奋斗出来的政客,他们的人生观和价值观的核心是 “利益”,和用 “实力”为自己,为自己公司以及为自己国家谋取最大的利益,其思维和行为方式是 “弱肉强食”的 “丛林原则”,他们很难成为眼光远大的政治家.因此,强大的发达国家的首脑很容易对内操纵民意对外实行霸权主义和掠夺以满足个人的或集团的狂妄欲望.而国际间既无严格制度又无强力的道德规范,因而会产生由霸权导致的国际冲突甚至战争.如何避免由霸权主义而发生的可能毁灭地球文明的战争?核大国之间的核武力平衡真的可靠吗? (C). 强大的发达国家推行在国际上霸权主义靠的是两种实力:军事霸权和经济霸权,缺一不可.美国就是靠着这两手在国际间推行单边主义的.(D). 为什么强大的发达国家的首脑要执行霸权主义? 因为这样一来可以为自己,为公司以及为国家谋取最大的利益.**首先,**发达国家都是三高国家:即生活水平高,消费高,和福利高.每个被新选上台首脑要维持或提高这三高水平并非易事,如果有实力挖别人的肉补自己的疮是最好的成绩.**其次,**靠自己已有的自然资源与能源很难维持高消耗经济的持续增长.石油与煤炭百年内可能耗尽,而核聚变尚无法控制,氢内燃机尚无头绪,无法取代汽油.因此,从国外市场掠夺和取得廉价能源和自然资源是保持其人民生活水平和经济发展的必要条件.**第三,**发达国家,特别是美国,是一个高外债的国家,要维持美元的国际信用不倒,没有霸权也很难.第四, 军工产业是暴利的产业,也是一个国家尖端科技和人材最集中产业,**古今中外,最先进的技术总是最先用于军事武器上的**.然而,它的发达和暴富是建立在军事和战争的血腥上的,而实行霸权主义既依靠和保持了国家军力的强大,又保障了军工产业暴富和技术的持续先进,何乐而不为? (E).由于富有的发达国家都把自己的国家的现实眼前利益放在首位,不愿出钱出力与其它国家合作共同解决对于危害人类的全球性的重大的自然灾害,如小行星碰撞地球,火山爆发,环境污染,室温效应引起的气温的升高和海平面的上升,地震预报,海啸,艾滋病,禽流感等等,[4]各国人民都将为此付出更大的代价. (F).**发达国家民主制度的缺陷:现在所有发达国家的民主制度只是解决了独裁制度中的 “公权私有”的问题,这当然是个大进步,但没有也永远无法解决了各种制度中的 “公权私用”的问题**,特别是现在两党制的民主制度缺点更多.法律只能对犯罪后进行惩罚,而不能起事先的防范作用.各种平权法和反歧视法不能消除实际上的不平等和歧视,比如,出身,种族,宗教,文化,语言地位等等歧视,这些都是社会动乱之源,是发展经济和民主所无法解决的,而只能从文化道德观上着手于以缓和.在现代发达国家,最主要的成就是经济的发展消除了地区差别,工农差别和城乡差别,而民主制度只能建立在这个基础上才能顺利实行.离开了这些社会政治经济条件,在一个有地区性大规模群众对抗的国家实行普遍的民主,或者在一个地区差别,工农差别和城乡差别很大的国家实行普遍的民主,只会引出动乱或多数暴政.

总而言之,无论是个人欲望所导致的纵欲和个人犯罪,还是由社会不平等和歧视所导致的社会动乱, 还是由霸权主义导致的国际冲突甚至战争都是人们头脑中重 “利”轻 “义”的结果.二十世纪１０００年的经济发展超出人类以往历史上总和,却給人类带来了两次世界大战.人类的物质生活水平愈来愈高,而道德水平却愈来愈低.甚至传媒文化都要从刺激人的感官和欲望中获取利益.在发展经济的同时,在大多数人的思想感情上如能将 “利益”和 “道德”, “正义”加以适当的平衡,则离个人快乐,社会和睦,世界太平就不会太远.孔子的学生问孔子道: “贫而无谄,富而无骄,何如?”孔子曰: “未若贫而乐富而好礼者也.”发展经济和民主制度都不能达到孔子所说的境界,**只有使正义在法制中占统治地位,同时使道德和正义深入人心,这就离大同世界不远了.**

在任何一个国家,保持社会的稳定是持续发展的必要条件,这就要保持社会内部和外部的适当的平衡.例如,保持适当的贫富之间平衡,个人利益和国家利益之间平衡,个人自由和法律之间的平衡,国家利益和外国利益之间的平衡.**对任何一个社会或国家来说,高失业率是社会不稳定的主要源泉.**

而在发达国家,除此之外,还须保持社会经济发展与社会福利之间的适当平衡,资本主义和社会主义成分之间的适当平衡,以及个人自由和道德观念之间的适当平衡等等.应当认识到,社会的不安定和停滞或倒退一定是某些方面过度失衡的结果.**一个发达国家长期实行被多数人决定的民主制的结果,必然导致社会过度向社会福利倾斜而减缓经济发展,最后导致失业率增高而造成社会的不稳定,并可能形成恶性循环.**

在实际上,在发达的资本家国家,虽然资本主义的私有制很发达和强大,但也已经包含了许多社会主义的成分,即,如股份制,共同基金,社会福利等.前苏联和东欧的解体和中国共产党向资本主义的转变只能表明**在一个国家内实行单一的社会主义公有制的失败,表明单一的社会主义公有制应部分地向资本主义的私有制转变. 前苏共和前中共社会体制中最大的矛盾是社会主义公有制和权力的私有制**,这是一种无法调和的矛盾.因为在那种单一的社会主义公有制度下,人们总是像机器零件一样固定在一个位置上,而不能按个人的意志调动.上层的几个领导成员为了保持和夺权展开不停的斗争,广大人民则成了他们的斗争的工具而无法发挥自己的才智和实现自己的梦想.苏联是一步到位一方面将权力的私有制变为权力的公有制,而将社会主义公有制变为资本主义的私有制.因为没有法律的保障和强力的介入引导,这种有序向无序巨大转变必然会引起社会的混乱,再由混乱转向另一种有

序是需要时间和努力奋斗的,而中国是逐渐地将社会主义公有制部分地转变为资本主义的私有制,并适当地保持社会主义公有制和资本主义的私有制的平衡.另一方面,也逐渐地将权力的私有制向权力的公有制转变,如废除干部终身制规定任期等.这种逐渐地有领导的转变当然会平稳得多,有序得多,社会的动荡也会小得多.

有一个重要问题值得人们深思,单一的社会主义公有制应部分地向资本主义的私有制转变,因为只有资本主义才能刺激人们对财富的欲望而大大地提高生产率使民富国强.而发达国家的资本主义私有制已部分地转向社会主义的成分,使社会能在稳定的状态下继续发展.这表明两种不同社会的发展今后将走向某种交汇点, 交汇点在何处? 单一的资本主义的私有制和单一的社会主义公有制都不可能在一个国家内单独存在,而一定是二者和其它制度等在一个国家内是长时期的共存.各个国家应按照自己的现实的情况,保持或调整它们之间的比例关系以保证经济发展和社会安定.也就是说,应当在一个国家内,尽量作到穷人能过社会主义生活,富人能有资本主义的享受,占人口多数的中产阶级能脱离贫困而过舒适的生活.其决定的标准在于如何作到使大多数富者"无骄"而 "有礼",同时如何作到使大多数贫者 "安居"而 "乐业".

7. 结论

根据以上分析,对人类社会发展的一些新观念可归纳如下: **(A)**.人类社会发展过程中的**量的进步和改善**可有许许多多因素促成,如,经济体制,社会组织,政治制度,文化素质,道德传统等等,而人的欲望特别是统治者的欲望作用显著,上**述因素的坏的方面可使社会的发展产生曲折甚至暂时的倒退和反复**.然而,社会中生产关系和社会经济形态的**质的转变**是由构成经济主体中的社会生产的主要动力(形态)的质的改变所决定的.**这对社会的发展和促进是直接的,直线的和不可可逆的.**所谓生产关系需要与一定的生产力相对应,其实就是与一定的社会生产力中的主要动力形态相对应. **(B).**在人类社会历史中,生产关系的改变不是被压迫阶级对压迫阶级进行阶级斗争的结果,主要是生产中先进的动力形态能为社会提供更多的社会财富,从而逐渐地取代了落后的动力形态,使代表新生产关系的统治者用和平收买或暴力行动取代代表旧生产关系的统治者.**(C).**在以往的厉史中,被压迫阶级通过无数次的暴力行动对压迫阶级进行阶级斗争的结果,只能蔚时减低被压迫的程度,而不能改变旧的生产关系.各种 "暴乱"甚至于 "革命暴力"大都只能起到了社会和阶级矛盾的 "减压阀"的作用,因为阶级斗争并不能为生产提供新的动力.因此,所谓工人阶级能推翻资产阶级而建立无产阶级专政的理论是没有理论依据和历史纪录的.在历史上没有整个阶级被消灭的记录和证据,以前的各国共产党消灭了旧的地主,资本家,其替代者虽名称不同,但作用和地位是相仿的.**(D)**.生产中的新技术和新动力主要是知识分子发明创造的,所谓劳动人民创造厉史,创造世界,等等都有一些片面性. **(E).**人类社会的全部历史表明,随着新生产动力形态的出现,新生产关系的萌芽和发展总是在旧生产关系中发生的,当新生产关系足够壮大时,就会取代旧生产关系.而不是通过几次暴難乱将旧生产关系彻底消灭,而以只剩下新生产关系而告终.同样,社会主义成分也只能在资本主义社会内萌芽和发展,而不可能在推翻整个资本主义后,再在其废墟上种植社会主义. **(F).**从现实情况可见,现在发达国家的后资本主义社会中,经济中除了资本主义私有制以外, 社会主义私有制的成分,或者说私有制中的社会主义成分已经愈来愈多,资本主义的私有制经济也已部分地向社会主义经济转变.**(G).综观目前天下大势,似乎是,在资本主义发达国家中,正是社会主义成份的愈来愈多而影响到社会经济的持续增长.相反,在社会主义国家采用市场经济和发展私人资本主义的同时,有过度的资本主义化而造成社会发展的过度不平衡.**

什么是发展中国家向发达国家转变的必要条件,例如中国,印度等? 当这些国家发展资本主义私有制的同时,也应当保留或保持一些社会主义公有制**和**其它所有制与之适当的平衡和尽量维持社会的安定. 当发展经济的同时,也应积极提倡一些重要的道德传统,使人的物欲与道德取得适当的平衡.当这些国家完成全国工业化和电气化的同时,也应加快向自动化,信息社会和知识经济发展. 中国人主张人做事要合乎"天理,国法,人情".也就是说,国家的发展也应如是,即要合乎自然环境和自然规律,也要合乎国情和依法办事,还要合乎道德规范和与人为善.

8. 人类社会的发展和人类欲望的膨胀

人类欲望是人类的主要精神特征.欲望是人的精神动力,它刺激每个人为自己的生存,发展,享受和快乐幸福而行动.

正是为享受和快乐的欲望决定了个人的生活目标.欲望从人的出生一开始就控制了人的精神器官的活动.[6]

为享受和快乐, 每个人总是希望为自己所必需的生活费用作最少的工作,而腾出更多的时间去享受生活或去实现自己的梦想.就是说,每个人总是想少工作劳动,而要多享受,这符合人的精神需要. 因此,主要社会生产主要动力的进步就缩短了人类的欲望与现实生活条件的距离.然而,这种差距又不可能被消除,甚至只要人类存在就不可能被缩短,反而是随着社会的发展而不断扩大,因为人类现实生活条件的改善远不及人类的欲望膨胀来得快.正是这对矛盾推动着社会的发展和进步.

为揭露宇宙和自然界的秘密,为了探求科学真理,总是刺激着许多学者终生为发明和运用新科技而奋

斗,其中,新动力(能源)和动力装置的发明和利用为推动人类社会的进步作了重大的贡献.**正是社会主要生产的动力(形态)的质的改变和进步最终决定了生产关系和社会经济形态的质的改变和进步**,从而有效地推动了人类社会的前进. 一旦具有新动力的新技术广泛地应用到生产而成为生产中的主要动力角色时, 新生产关系,新社会经济形态和人们的生活方式也随之而来,这就是人类好的欲望产生的必然结果. 但是,**人类欲望本身就是双面刃,它有坏的一面,它已随着社会的发展而向坏的方面发展,它导致国家之间的冲突和战争,人与人之间的争权夺利,宗教种族间的冲突,自然环境的污染和毁坏等等.同时,过度的个人自由导致大量的个人犯罪和纵欲.愈来愈多的社会福利也阻碍了社会经济的发展.许多西方的学者曾经认定人们已经变为先进技术的奴隶.[7] 我认为,大量的现代社会的人已经变为坏的个人欲望的奴隶,如权力,金钱,毒品,赌博,性等等.科学技术永远是人类力量和智慧的源泉,而且总是在推动人类社会的前进.人类最大的灾难不是先进的科学技术,虽然它能被用于制造毁灭人类的武器,而这正是许多人的恶性欲望膨胀的结果.特别是那些政府首脑的权,利,名欲望的恶性膨胀对人类危害最大.人类的欲望已成为打开的潘朵拉魔盒而不能被控制吗?那些恶性欲望为什么不能为社会的发展和进步有所改善,抑制,控制或者纠正呢? 现代科技飞跃进步和现代发达社会的建立是西方文明的伟大成就.简而言之, 西方文明的核心是重 "利"轻 "义",而东方文明(中国文明)的核心是重 "义"轻 "利",人类社会发展到今天,生活物资已够充分,只有东西方两种文明的溶合才有助于人类社会的继续发展和世界大同.**

作者的话:文中有不少有争议的重大观点,衷心欢迎批判.争论总能促进社会科学的发展和进步.

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Jun 4, 2008

哲学的定义, 选择与自由及偶然

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摘要：关于世界的本原，古希腊与古中国都形成过各种学说，在古希腊有水、火、气、土、无限、数、一与多、爱与恨、以太、种子原子、理念等学说。在古中国有阴阳、五行（金、木、水、火、土）、天、道、理、一（一生二，二生三，三生万物）等各种学说。古典哲学始终是一种纯思辨的猜想，因此至今人们都无法对哲学这一概念进行定义。随着人类认识的不断深化，哲学逐渐分化为宗教与科学。宗教认为上帝是世界的本原，现代文明的宗教都已不同程度已演化为伦理学。科学以宇宙学、物理学、数学、化学、生物学、神经学、信息学、美学等逐渐揭示了各种事物的属性，同时也发现世界万物之间存在着普遍联系。科学家们知道世界有一个非神的本原，却一直苦于没有找到什么是真正世界本原。从生物的生命体验（包括如饥饿、性欲等自发性感受）出发，综合性论述了选择与自由、必然与偶然、可能与现实、原因与结果等之间的关系. [New York Science Journal. 2008;1(3):45-49]. (ISSN: 1554-0200).

一．哲学的定义

哲学的目的在于找到世界的本原，并且在本原的基础上对千差万别、千变万化的世界做出全面、统一、简洁、自洽的解释。

古哲学包罗万象，并希望在万象中找出世界的本原。关于世界的本原，古希腊与古中国都形成过各种学说，在古希腊有水、火、气、土、无限、数、一与多、爱与恨、以太、种子原子、理念等学说。在古中国有阴阳、五行（金、木、水、火、土）、天、道、理、一（一生二，二生三，三生万物）等各种学说。古典哲学始终是一种纯思辨的猜想，因此至今人们都无法对哲学这一概念进行定义。

随着人类认识的不断深化，哲学逐渐分化为宗教与科学。宗教认为上帝是世界的本原，现代文明的宗教都已不同程度已演化为伦理学。科学以宇宙学、物理学、数学、化学、生物学、神经学、信息学、美学等逐渐揭示了各种事物的属性，同时也发现世界万物之间存在着普遍联系。科学家们知道世界有一个非神的本原，却一直苦于没有找到什么是真正世界本原。

古典哲学与古典物理学猜想以太存在，却一直没有证明以太的存在。自爱因斯坦创立相对论后，近代与当代的科学理论最大失误就在于忽视或否定以太的存在。以太旋子学不但站在自然哲学高度，以物理学实验与观察为基础，如从粒子物理学（基本粒子是微观以太漩涡）、光学（光以以太为传播介质）、宇宙学（星系是以太漩涡的产物）等方面或层次证明了以太的存在，而且发现以太是世界的本原，

包括我们人在内的世界上千差万别、千变万化的所有事物都不过是以太相同与不同的表现形态而已。世界是以太的世界，质子、中子、电子等基本粒子都是由以太构成的微观以太漩涡，它们都是旋子。以太旋子学对世界做出全面、统一、简洁、自洽的解释，在重建科学理论的同时颠覆了现有的科学理论。以太旋子学终结了古典哲学猜想，以物理学对哲学进行了定义，或者说以物理学实验终结了古典哲学猜想，将古典哲学还原为现代物理学。

二．论选择与自由及偶然

1、选择与自由

为讨论必然与偶然的关系，首先需要将生物界从非生物界划分出来。生存环境对生物的形成、生存、进化等既具有利的一面，又具有害的一面，生物能够对生存环境进行生命体验，以实现其趋利避害之目的，即生物能对环境进行选择。达尔文的进化论强调的是环境对生物的选择，适者生存，不适者淘汰。然而站在生物的立场上看，适应环境就是选择环境，环境选择与选择环境是同一问题的两方面表现。

生物对环境的选择具多样性，选择意味着自由，意味着自由意志。动物选择环境的能力优于植物，越是高等动物其选择性越强。生物提高其选择能力就是提高其选择环境的自由度，自由是生物进化的动力，生物向着争取更大自由的方向进化，生物史与人类史就是一部争取与实现更大自由的历史。

自由意志有盲目与自觉之分，争取更大自由于一般生物是本能的即盲目的。为争取更大自由，人逐渐进化出高级的认识能力。高等动物只能够进行具象思维，自从人学会以概念命名具象后，人逐渐学会了概念思维，只有人能够通过概念思维逐渐走向对自由的自觉追求。

2、选择与偶然

人们很早就发现了偶然，但始终没有找到产生偶然的原因，实际上选择才是产生偶然的原因，选择是既可以这样也可以那样，选择前是无法确定的。没有选择、自由与偶然就谈不上生物的进化，法国生物学家莫诺说：“自由的偶然性才是生物界总的一切革新和所有创造的源泉。”

3、必然与偶然

必然与偶然的关系，从来就是哲学家们关心的课题。自从哲学分化为宗教与科学后，在宗教领域，上帝具全知全能的自由意志，能够进行任何选择，必然与偶然的关系被简单化了；在科学领域中，必然与偶然的关系就成了一个需要证明的重要课题。爱因斯坦等人认为世界受必然律支配，他说上帝不掷骰子。以波尔、海森伯等为代表的量子学哥本哈根学派则认为世界受偶然律支配，包括光子在内的微观粒子以几率波方式运行着。争论至今尚未了结，必然与偶然的关系仍然是个谜。非生命物质无所谓适应不适应环境，非生物不具自由意志，不能够进行自由选择，非生物界受必然律支配，比如所有天体或气体中的气体粒子都以必然的方式运行着，在任何时刻，无论是天体还是气体粒子，它们都有确定的空间位置、即时速度与即时方向，具确定动量等。

必然不具选择性，必然只具唯一性。由于生物产生于非生物且受必然律制约，因此偶然产生于必然且受必然律制约。选择、自由不可能是任意的，在必然律的制约下，偶然表现为偶然律。

4、可能与现实

在选择成为现实之前，选择还只是可能。但选择一旦由可能转化为现实，如果没有选择的干扰，偶然就成为必然。比如打台球前，我们击打台球力度与方向等具选择性，此时台球将要运行的速度与方向等具偶然性。然而一旦击打台球，如果没有选择性干扰，台球将以确定的速度与方向运行，即以必然的方式运行。如果此时进行选择性干扰，比如对正在运行的台球吹气，由于吹气的力度与方向具选择性，这时台球的运行又具偶然性。只是吹气后，如果再没有选择性干扰，台球又以必然的方式运行。又比如甲请求乙做某事前，甲的请求具选择性，但是甲最终只能在诸多请求中选择其一，一旦甲使可能成为现实，偶然就成了必然。乙得到请求后，对甲的请求乙也具选择性，同样地，乙也只能在诸多选择中择其一，一旦乙使可能成为现实，偶然也成了必然。最终选择具唯一性，选择是以唯一的方式使可能成为现实的。在选择存在的前提下，必然与偶然可以相互转换，偶然可转换为必然，必然也可转换为偶然。

自由与偶然都产生于选择，选择性越强，偶然性与自由度越高。同时选择、自由、偶然等都受必然制约，其具体表现为：首先生物界产生于非生物界，且生物的生存环境极为有限，生物对环境的要求极为苛刻。其次任何生物都不是全知全能的，生物的选择能力非常有限。正如上所述，最终选择具唯一性，选择一旦从可能转化为现实，偶然就转化为必然，因此自由与偶然是必然在极为有限条件下的一种特殊表现形式。

5、原因与结果

世界上的所有事物都处在因果关系中，并且任何结果的产生必定有其原因，而原因成立则必定产生结果，没有无因之果，也没有无果的原因，所有事物都处在因果链的关系中，原因与结果有着必然的关系。然而原因可能是无选择性的，或者说是必然即唯一性的，也可能是选择性的。相同的原因产生相同的结果，不同的原因产生不同的结果，选择既可以这样也可以那样，不同选择产生不同结果。只是选择可能对也可能错，但是无论是对还是错，它们都会产生结果。

选择具偶然性，偶然同样可以成为原因也可以成为结果，偶然也处在因果关系的长链中。原因总在前，结果总在后，现在不可能成为过去的结果，将来不可能成为现在的结果，比如人的过去、现在、将来都处在选择的因果链中，虽然过去的选择一去不复返，但它们虽不决定却影响着现在的选择，现在的选择虽不决定却会影响将来的选择。

任何结果的产生都有其原因，有时原因或因人的感知能力有限、或因原因本身非常复制或瞬间变化而不为人所知，于是人们有时将非生物界的不知其原因的结果比如突发事件也称之为偶然，这是对偶然的一种片面或错误理解。

6、必然、偶然与数学

所有事物都具数量性，必然可用数学进行精确描述，事实上如果非生命事物不具必然性，我们就不可能运用数学公式对它们进行精确计算。尽管偶然具多样性，但它仍然受必然制约，即偶然仍具规律性，因此人能以概率、统计或模糊数学等对它们进行描述。然而即使是必然，人们对它们的精确计算仍然是极为有限的，比如产生某一结果的直接原因的数量是有限的，但在因果链中的间接原因却是无穷的，我们不能对无穷多的原因进行精确计算，无穷多原因中的量是不可测的量与不可计算的量。人类甚至现在还不能以数学公式对三个相互作用的天体的运行进行精确描述，更不能用数学公式对以电场、磁场、万有引力场等场相互作用着的气体粒子运动进行精确描述，温度只是对粒子平均动能、势能、波能的统计。

7、人类社会

建立在生命体验基础上的选择与自由一方面是自觉的，另一方面又是盲目的。越是高级的动物其自觉选择性越强，自由度也越高，在所有物种中，只有人能够进行概念认识活动，人的自觉选择性最强自由度最高，人类社会最富偶然性。然而即使是上帝也不可能全知全能，上帝也创造不出他所不知与所不能的事物来，至少上帝也不知道用怎样的方法创造出一块他既举得起又举不起的石头来，实际上全知全能是一个悖论。世界是无边无际无始无终且不断变化的，人类永远无法达到全知，更无法达到全能。

选择性增强意味着生物适应环境的能力的增强，就具认识能力的人而言，选择性增强还意味着改变环境能力的增强。生物的进化、人类社会的发展归根结底是生物与人的选择性增强与自由度的提高。选择性或自由度的提高既是生物进化的原因与动力，也是人类社会发展的原因与动力。

结果的产生往往需要一定的时间，因此在最终结果产生之前，人还可反复进行选择，这样就可以改变因果关系，改变事物发展方向，使事物向预期的方向发展，以便实现原有目的。人一生都处在自觉或盲目的选择中。人类社会由所有个人有机构成，每一个人都以自己一生的经历书写与改变人类历史。在历史形成因果长链中，绝大多数历史人物湮灭在产生现在结果的间接原因中，只有语言、重大历史事件、重要历史人物、历史中的发现发明、文物、著作、传统、传说等还在起着产生现在结果的直接原因的作用。现在的人不可能改变过去，然而每个现在的人都能够并且必定以自己的选择改变人类的将来，正如每个股民都以自己的选择决定股市曲线的走向，只不过不同的人改变的程度不同。

生物在争取更大自由时需要遵循生存规则，人类在争取更大自由的同时，人类社会的发展也受必然律与偶然律的约束，因此尊重自然规律，以道德、法律约束自己，对每个人来说都成了不可避免，理当更自觉。社会发展不是直线式的而是弯弯曲曲甚至倒退的，在人类发展的滚滚长河中，人类社会中存在着各种各样的大大小小的漩涡。

认识的目的在于预见，在于获得更多选择与更大自由。如果世界不具必然性即不具唯一性，事物是不可预见的。认识必然律可进行精确预见，认识偶然可进行概率预见。我们能以数学公式精确描述自由落体，却不可能以数学公式精确描述人的活动，不可能以数学公式精确预见股市曲线走向。

不管人具多么高的选择能力，不管人多么自由，当可能成为现实时，任何人的现实性活动总是唯一的，人一生的活动最终表现为一条唯一的运动轨迹。对于没有选择性的自然来说，即忽略选择性，这条唯一的运动轨迹是以必然的方式存在于因果链中的。

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后记：

尊敬的老师，读者，您好！

我以自己一辈子的兴趣、学习与思考，再敲打 8 年的计算机，写成了约 60 万字的《世界的本来面貌》，其上篇《以太旋子学》约 27 万字，于 07 年 10 月出版，下篇已成初稿。该著作不但发现了世界的本原——以太（Ether），而且从以太出发，对纷纭复杂的世界做出了全面、统一、简洁、自洽的解释。近代与当代的科学理论最大失误在于忽视或否定了以太的存在，而新理论恰恰以以太为本原，新理论在重建过程中颠覆了现有的科学理论。

实验与观察是建立科学理论的基础，然而实验与观察是一回事，人们对它们作出怎样的解释以及建立起怎样的理论是另一回事。尽管后者力求真实反应前者，仍然可能是片面或错误的。《世界的本来面貌》一书中没有提供一个新实验，却几乎对所有基础性实验做出了新的解释，这些实验见诸于现行中学、大学相关教材中，正是这些实验构建了现代科学理论的基础。以太旋子学建立在众所周知的经典实验基础上，决不是纯思辨的产物。

如需查看原著，请将您的详细邮寄地址及邮编告知，我将免费赠此书。诚请斧正，谢谢。

此致，

敬礼！

陈果仁

“对立统一规律”(矛盾论)的科学依据和结构类型 6.24.08

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摘要: “越是简单的东西越难明白”. “纯粹的谬误並不可怕, 可怕的是混有真理的谬误”.

内容提要: 我们宇宙中最多的物质是氢原子,它也是最简单的元素.简单就意味着稳定.所以氢是宇宙中最简单最多最稳定最长寿命的元素.

根据近代科学和粒子理论, 其它的化学元素都是由氢原子在恆星和超新星中合成出来.一般恆星最多可以將氫和氦融合到像鐵和鎳那樣重的元素, 至於更重的元素則主要從超新星而來. 超新星就是大恆星的爆炸,在這個超級熱的爆炸中, 藉由氦原子核互相結合成較重的原子核,然后這些較重的原子核再捕捉會衰變成質子的中子, 大部分較重的元素會因此而產生.在恒星之外层和冷的宇宙空间和行星上, 氢除了稀有气体之外,几乎可与所有元素结合乘化合物.以氢碳为基础的碳氢化合物就形成了有机物. 有机物在类地(球) 行星的适当环境下, 就有可能演变进化成生物和人类.因此,**宇宙中任何复杂的物体都是由最简单的许多氢原子所结合成的元素和化合物等层层结合而成.所以复杂来源于简单.**

因此,由一个质子 p 和一个负电子(e^-)所组成的氢原子 H 是构成我们宇宙中的任何物质,物体和事物的元件和基石.而氢原子本身就是由多对的矛盾体组成的.因此,没有一个事物是由单一的矛盾构成的,所有事物都是有多种矛盾构成的矛盾体系或矛盾系统.

因此, 宇宙中任何事物, 不管是现存的或已存在过的事物不管是个体群体或整体,都是由相互对立而又相互依存的矛盾体组成的.所谓 “矛盾体”或 “对立统一体”, 就是其内部的各个结构部分和其间各种斥力(如电斥力,热斥力,辐射压力,分离力, 恨等)与其相对应各种引力(如万有引力,电引力,化学键,凝聚力, 爱等)保持相对的对称平衡以维持事物本身的相对稳定的结果. 这就是中国古代哲学 “相反相成”的道理.如果内部斥力大于引力, 物体就会膨胀,破裂, 改变结构,解体爆炸. 如果内部斥力小于引力, 物体就会缩小,挤压,破裂, 改变结构,塌缩. 因此, 内部对称与平衡度愈高的物体和事物,其稳定性就愈高,其寿命就会愈长.中国古代佛道家所追求的得 “道”,就是要在修炼中保持身心的均衡和宁静,以达到延年益寿长生不老和成仙的愿望.

事物本身与外界一方面是靠斥力和引力的相对平衡以维持其相对的稳定的内部结构和运动状态(对立统一), 其随时间而产生发展和消亡的过程是与外界在同时间内持续作用的过程, 在这个过程中, 当事物内部的某部分或整体的斥力或引力增减至某一临界值时, 该事物的相对应部分或整体将发生结构和形态的改变而消亡或转变成另外的事物.事物本身保持稳定的另一条件是该事物前后所吸收和排除的能量和物质应达到相对的平衡. 事物与外界的碰撞作用是突发性的突变,往往对二者都造成直接的损伤破裂甚至毁灭性的解体爆炸而消亡。

本文的新观点和重点在于将矛盾体按照其不同的结构分为不同类型,各种不同结构类的矛盾体将有不同的特性,运动形态和转化结果,混淆矛盾的类型会导致重大的错误结论.

[New York Science Journal. 2008;1(3):50-65]. (ISSN: 1554-0200).

关键词:对立统一规律(矛盾律),矛盾体结构的不同类型, 矛盾依存的中间体,事物运动变化过程的中间态, 氢原子的对立统一结构,

I. 对立统一规律 (矛盾规律) 的普遍性. 氢原子的对立统一结构.宇宙中无论多么复杂的物体和事物都是由许许多多氢原子层层迭迭结合而成.复杂来源于简单. 老子曰: "大道至简".

我们宇宙大约共有 10^{80} 氢原子.一个体重 75 公斤的人大约由 5×10^{28} 个氢原子组成.

对立和统一规律 (矛盾律)是小至氢原子大直到恒星和星系所固有的关系,是我们宇宙中现存的和过去的每一个独立存在的事物内部与外部之间的最根本的规律,是我们现在的物质世界,人类社会和人类精神世界等中所固有的和共有的最根本和最一般的规律.

黑格耳和以后的马克思恩格斯列宁毛泽东等对对立统一规律或者说矛盾论作出了深入研究和取得了巨大成就.然而,由于后者们常将研究工作太注重服务于他们的政治目标.因而将对立统一律简化而导致一些重大的错误结论.比如,由矛盾对立面的转化而得出无产阶级专政.由一分为二而反对合二为一,并将一分为二绝对化.煽动仇恨和斗争虽然便于夺取政权,然而在夺取政权后仍然不断扩大仇恨和斗争,必然导致社会分裂和经济崩溃.如果与天地人斗争就其乐无穷,而爱天地人并与其和谐相处就会失去快乐而悲哀无限?再者如果更进一步追问,事物真的就只限于一分为二吗?那么, 多极化, 多元化, 多样化等又从何而来?

对立统一规律 (矛盾律)其实就是每个事物内部各个物质组成部分之间及其相互作用力(引力和斥力)之间在一定的条件下保持其对称平衡的规律.只有该事物保持其内部平衡和与外部的作用也保持平衡的情况下, 该事物本身才能保持稳定,即稳定的结构,性质和运动状态.

对立统一规律的普遍性从何而来?就在于构成我们现今宇宙中, 最基本最大量最普遍最简单最稳定和最长寿的物质是氢原子. 氢原子是由一个质子 p 和一个负电子 e^- 所组成.其内部组成和作用力(斥力和引力)的对立统一达到了最高的对称平衡,因而达到了最高的稳定. 现今宇宙中的各种元素化合物无机物有机物和生命都是由最基本的许多氢原子所组成. 同样,小至宇宙空间物质,大至行星恒星也是由最基本的氢原子所组成. 因此宇宙中所有物体中的 "矛盾"或 "对立统一"的本质就是由许多氢原子层层迭迭所组成的各种事物内部复杂结构的 "对立统一"和 引力与斥力的平衡存在的反映,这就是中国古老易经哲学中的 "天地人三才合一" 思想正确性的来源.

1974 年乔治（Georgi）和格拉肖（Glashow）提出了把强、弱、电三种相互作用统一在一起的 SU（5）大统一理论,按照该理论,质子是不稳定的,它的寿命约为 10^{28} ～2.5×10^{31} 年. 但实际上美国,印度和日本等国的实验尚未有确切的公认的证据证实质子有衰变的迹象.

按照近代粒子物理理论, 质子核(内部) 由两个上夸克(u)和一个下夸克(d)组成(即 uud),夸克之间的核引力(核力,色力)与夸克之间的斥力(泡利不相容原理)达到了最稳定的平衡即矛盾的统一,而使夸克长期被禁锢在质子内无法脱离,从而使质子的寿命超过 10^{30} 年.相比较而言,而宇宙的年龄才不过 $1.37*10^{10}$ 年,地球和太阳的年龄约 50 亿年($5*10^9$ 年). 质子核外部是质子核内正电子(e^+)和其外层运动的负电子(e^-)的引力和斥力达到了平衡即矛盾的统一而成为氢原子. 因为正电子(e^+)和负电子(e^-)是质量和电量完全相等而有电引力的粒子.由于质子在外层运动的单身负电子(e^-)较易脱离使质子成为正离子,因而两个质子常结合成化合物氢分子(H_2)或与其它元素组成化合物以满足该化合物外层电子所需容纳的饱和电子数,如盐酸(HCl),水(H_2O)等.多个质子在恒星和超新星内合成其它稳定的元素时,核内不能仅仅由质子组成,根据泡利不相容原理,多个质子在核内会产生斥力, 因而质子间必须由中子(n)间隔开

来以维持核内引力和斥力的平衡从而保证该元素的核内部稳定.所以元素核内的中子数都等于或大于质子数.如氦原子核(He)就由两个 p 和两个 n 所组成.

中子(n)由一个上夸克(u)和两个下夸克 (d)组成(udd).单独自由的中子是不稳定的,在约 15 分钟(896 秒)内会衰变为质子.这种不稳定大概是由于中子(n)内的两个下夸克 (d)之间的斥力大于质子内两个上夸克(u)之间斥力的缘故.但由一个中子和一个质子结合成的氘核以及两个中子和一个质子结合成的氚核却都能维持其稳定,因为其核内上下夸克之间的适当的空间结合维持了内部各夸克之间的引力和斥力的平衡.

这就是说,**只要质子或者说氢原子不衰亡,我们宇宙中现有的各种有关物质结构和其运动的各种科学规律就不会改变. 对立统一规律 (矛盾规律)也就不会改变.**

II.我们现今宇宙中的物质之间的相互作用力

根据近代粒子物理的研究结果表明，构成物质世界的最基本的粒子有 12 种，包括 6 种夸克（上、下、奇异、粲、底、顶）,3 种带电轻子（电子、缪子和陶子）和 3 种中微子（电子中微子，缪中微子和陶中微子）,它们都是长寿命粒子. 氢原子中就包括着夸克,电子和中微子.大量氢原子的存在和在不同条件下的相互结合是进化成人类的物质基础.而各种元素粒子之间在不同情况下同层次间和不同层次间所形成的引力和斥力的平衡是千变万化的,它们形成了各种各样物质千变万化的性质和运动状态,它们组成和演变成现今的千万种物质生命和人类. **设想如果粒子之间仅仅有斥力而无引力, 或者斥力在任何地方总是大于引力,我们宇宙将是一个由无数孤立粒子组成的冷冰冰的世界.再设想如果粒子之间仅仅有引力而无斥力, 或者引力在任何地方总是大于斥力,我们宇宙将塌缩成为一个奇点,即回到宇宙大爆炸的起点----普郎克时代.**

在自然界, 引力---正负电子的引力,化学键,分子链,万有引力,核力等. 斥力----同性电子的斥力,热压力, 辐射压力.泡利不相容原理所形成的排斥力等

在生物界----除上之外, 还有新陈代谢,酸碱平衡,生存竞争等.

在人类社会----除上之外, 还有利害矛盾,权力斗争,阶级种族宗教文化各种矛盾等等.

在人类思想感情-----除上之外, 还有感性与理性的矛盾,得失,进退,存亡,爱恨情仇等等,

我们现今世界各种各样物质千变万化的性质和运动状态,特别是生命和人类和复杂遗传因子 DNA 等等均源于以氢原子和各种元素为骨架所带的外层电子在不同情况下的复杂的藕合形式和其藕合后的运动状态.而这正式现代科学技术尚未完全了解和解决的问题.

III. 对立面(矛盾)共存的基础或者说基本条件必需统一和依附于一个或多个中间体. 中间体将矛盾的双方既分隔又结合而共同组成一个独立的事物. 中间体比矛盾的双方愈强大,该事物就愈能保持长期的稳定.

一个独立的事物是由诸多的“矛盾”的统一体构成的系统.所谓“矛盾”的统一体不只是包括矛盾的双方,还包括其支撑和依附的中间体而共同组成的一个统一体,只有它们有机地共同组合在一起才能构成一个独立存在的事物,仅有矛盾的双方是不可能构成一个独立存在的事物的.

仅仅一个正电子(e^+)和一个负电子(e^-) 不可能组成一个独立的个体,二者碰在一起只能湮灭成一堆能量,所以它们只能依附在一个原子核上组成一个氢原子,或者共存于一个原子核内组成一个中子才能成为一个相对独立的事物. 甚至在质子核内部矛盾的双方也有它们支撑和依附的的中间体.

质子核由两个上夸克(u)和一个下夸克 (d)组成(即 uud),三者有不同的颜色即色引力.它们其中的任何一个夸克即是另外两个矛盾夸克之间的支撑和依附的的中间体.而任何两个夸克之间的引力 (核力,红兰绿三种色力)与夸克之间的斥力 (泡利不相容原理)均达到了很好的平衡即矛盾的统一.也许正是核内 uud 这种三足鼎立而又不可分割的结构才保证了质子核的最高的稳定性和最长的寿命. 在两个质子组成一个氦原子时,必须至少还要两个中子作为中间体将它们结合在一起,也可以说是将质子既分隔又结合起来.

电子和中微子内部是否也由矛盾的统一体组成?这是一个更深层次的问题.近代科学还不能解答这些问题.但是电子有结构和可分解是无疑问的.因为电子可以在质子内被三分到三个夸克上就是明证.

一个 DNA 的基本结构单元称为核苷酸.其中除了一个碱基和一个磷酸的这一对矛盾以外,中间还必须有一个糖分子.正是这个糖分子将碱基和磷酸牢固地联接在一起又分隔开来才保持了核苷酸的稳定.这种大量的核苷酸的有序连结形成了 DNA 的极其复杂的稳定可靠遗传作用.

随便一男一女不可能组成一个家庭.他们必须要有财产利益爱慕和能满足对方的各种需要作为条件或基础.

一个封建社会不能仅有地主和雇农佃农. 还一定有大量的中农工商业的老板和雇工.同样,一个资本主义社会不能仅有资本家和工人, 还一定有许多大量中产阶层,自由职业者,甚至还有奴隶社会和封建社会的残余.所以,列宁说过: “没有纯粹的资本主义.” 就是这个道理.

中间体的作用: 比如左中右,前中后,敌友我,前线中间地带和后方,正负数之间的许多数和 0 等等.说明中间体的存在是矛盾双方依附或依存的和不能相互湮灭的必要条件,也是矛盾双方盛衰和可能转化的基础.在战争中只有能得到最多中间群众拥护的一方才能战胜敌人. **中间体将矛盾的双方既结合又隔离开来而组成一个活动的整体**.

矛盾的双方的既排斥又吸引的相互作用力只有在中间体的介入下才能达到平衡而组成一个相对稳定的事物. 矛盾相当于毛, 中间体相当于皮.皮之不存,毛将焉附. **中间体比矛盾的双方愈强大,矛盾就愈能保持长期的稳定**.如氢原子核比一对正负电子重大 1840 倍.这是氢原子最稳定最长寿命的物质基础.如氦,铁和各种元素和各种化合物甚至构成生命的物质,所有组成物质的原子核中由于中子的存在使各个原子核比其外围总电子重大 1840 倍还多.

因此, **稳定的矛盾体(事物)是中间体比矛盾本身重大得多的橄榄型的矛盾体,**

事物不是一分为二而是一分为多,当事物被分解时, 不仅仅分解为矛盾的双方,总还有其它的东西被分解或者产生出来.同样,既然所有的矛盾必需有所依附的中间体,那么, 事物就不是合二为一,而是合多为一.

先从宇宙中最简单原子氢 H(质子 $p + e^-$)说起. 原子氢仅能存在半秒钟,随后便重新结合成分子氢 H_2,并放出大量的热.把原子氢气流通向金属表面时,原子氢结合成分子氢的反应热可以产生高达 4273K 的高温,这就是常说的原子氢焰,氢分子 H_2 虽然很稳定，但在高温下,在电弧中,或进行低压放电,或在紫外线的照射下,氢分子能发生离解作用,得到原子氢.这就是说,无论是 2 个 H 变成 H_2,还是 H_2 分解成 2 个 H,都需要大量的能量供给或释放,或者有高能粒子的参与.另外, 氢离子 H^+也只能在水中才能存在,而同时还必定有 OH^-离子存在于水中才能平衡,这就是说, 氢 H 不可任意分解成为 e^-和 H^+ 两部分.而在水中的氢离子 H^+也只有有用电解的方法供给电子 e^-才能得到原子氢 H.

一个中子可通过弱作用衰变为质子,放出一个电子和一个反电子中微子. 质子很快就会捕

捉一个 e^-而成为一个氢 H. 如上所述, 氢 H 很快就会与另一个氢 H 合成氢分子 H_2.所有这些过程都必须有能量的参与,这能量就是第三者.

如前所述, 核苷酸.其中除了一个碱基和一个磷酸之外,还必须有一个糖分子共三者所结合而成。一对光棍的男女无法组成一个稳定的独立的家庭.他们还得有其它的各种共同的财产,政治经济利益,文化感情和家庭等等各种需要或对对方各有需求.

在封建社会, 不仅有地主阶级和农民阶级中农小手工业者.在资本主义社会, 不仅有资产阶级和工人阶级, ,还有大量的中产阶级,自由职业者.

当中国共产党在 1957 年将 5%的知识分子打成资产阶级右派时,受损伤的就不仅仅是这 5%知识分子本人,而还包括其家庭成员及许多复杂的社会关系和对全社会的影响.这一大片中间体所受到的伤害造成了可怕的后果.

人类的生存和发展不仅需要其生活所依赖的动植物共同的生存和发展,而且还需要将共同聚居的环境保护,以适宜共同的生存.

IV.对立统一体(矛盾体)的类型.这里所指的类型是对立统一的物体内部的实质结构

矛盾存在的**空间结构形式**有不同类型.每种类型的矛盾有其特定的性质,作用方式和变化规律.下面只有 A 型矛盾类型是基本的原生的,其它的 B,C,D 型都是次生的派生的.

(A).反质型矛盾体(相反相成型, 异性相吸引型); 矛盾的任何一方不能完全脱离对方而成为两个独立的事物.矛盾的双方在这种类型中具有相反的性质, 它们同生共灭, 相互需求,相互依存,不离不弃. 二者互相结合(化合)在一起成为一个新事物.这新事物的新结构和新特性并不等于原来矛盾双方二者的叠加,而是质变.二者的主次地位不能互相转换和颠倒.这是宇宙构成任何一个独立稳定的事物的诸多种矛盾体中必需的和最基本的原生类型,它反映了该事物的主要性质.反质型矛盾最显著特点是其构造为 “对偶型”, 或 “两极型”, 或者说 “共轭型”,它们成双成对地存在.其表现形式为异性相吸的引力和互相需要不弃不离. 在正常情况下,二者的互相排斥是在有中间体的条件条件下形成的.

矛盾的吸引和排斥的相互平衡依赖其间必**有一个较大的中间体作为稳定中心,中间体比矛盾的双方愈强大,矛盾就愈能保持长期的稳定.以正负电子对组成为 “对立统一体”或者 “矛盾体”的氢原子是构成宇宙间各种事物的最稳定的基本物质单元, 是形成宇宙中恒星行星甚至构成生命的物质基石.**

当各种元素在一定条件下能结合成化合物或复杂的物体尤其是在地球上结合成水和碳氢化合物时.有机物就可能发展演变成生命生物直到人类.因为每一个层面和层次的结合(化合)都产生了质变.

一个电子只能和一个质子才能组成一个氢原子. 氢原子就变成一个稳定物. 也就是说, 一个电子如要和一个正电子相组合就必需找一个比自己重 1840 倍的核子作媒介以成为稳定中心. 这个媒介或稳定中心的性质应既不带正电也不带负电,它对两极的正负电子来说是中性的, 但不是绝缘的. 正负电子通过中心体而相互作用以维持一个平衡和稳定的整体,成为一个独立的事物,一个本质上不同于原来正负电子的新事物. 同样, 两个夸克不能组成一个质子或中子,而必须由第三个夸克作为中间环节才能组成. **既然这氢原子是宇宙中最小,最简单,最基本的原始的物质结构的形式, 其它复杂的事物只不过是这许许多多氢原子在不同条件下组成多层次的组合和结合的结果**. 因此, 在宇宙中, 一个过去的和现存的稳定的结构或事物除了两端(极,边)有相互对立的一对或多对较小的矛盾组合体外,中间还要有个较大的中间体 (或中性体)作为该事物的重心和稳定部位. 总体组成一个橄榄型矛盾体.没有任何

一个事物是单纯由一对简单的两极型矛盾体所组成. 如上所述, 一个正电子与一个负电子绝不能组成一个粒子, 而只能湮灭成一堆能量. 一个磁铁的两极间如果没有磁铁体也不能存在. 一个只有资本家与工人而无中间(产)阶层的资本主义社会是不可能存在的, 有少量的中间阶层是一个不稳定的社会, 只有中产阶层占多数的社会才是稳定的. 同样, 只有在中产阶层占多数的社会在实行民主政治时,才能保持社会的稳定和发展. 在中国大陆, 有九亿农民的现况下,中国要想成为一个较高速发展的稳定的民主国家, 一定得将 5~6 亿农民转变成中产阶级. 为什么从前毛泽东时代的共产党也能保持社会某种程度的稳定? 从权力的观点看, 那种社会仍然可以说是一个橄榄型社会, 专政者和被专政者都是少数人, 中间大部分人是无权而似有权者, 一旦统治者通过一次又一次地政治运动将打击面过份扩大到中间阶层时, 其统治地位就危险了.

在这种矛盾体内, 不可能由矛盾的一方将另一方消除而使整个矛盾消失. 比如, 由正负电子和质子所组成的各种原素分子化合物等等都由许多对正负电子对平衡地组合而成.由有一个碱基和一个磷酸和一个糖分子组成的核苷酸.由地主与农民为主组成的封建社会, 由资本家和职工组成的工厂或公司, 由统治者(领导者)和被统治者(被领导者)所组成的政府等等. 所有这些矛盾的一方不能失去另一方而单独存在.它们双方是同时增加或减少,或者是组成其它事物时的成对参与者.比如质子和中子组成的其它原素分子化合物时不可能只有正电子或负电子参加,而必须是正负电子成对地与其中间体质子一起参加.如核苷酸是 DNA 的一个基本结构单元.其中是一个碱基和一个磷酸的这一对矛盾.当 DNA 复制时,每个核苷酸中碱基,磷酸和糖分子缺一不可.

在人类社会的进步的每个阶段.主要矛盾的双方不可能一方消灭另一方而单独存在. 比如在封建社会, 地主阶级和农民阶级是一对相互需要而又相互对立的阶级,农民不可能消灭地主阶级建立一个只有农民的长期稳定的社会制度. 因为一旦农民剥夺了地主的土地和财产, 他们本身中的一部分就变成了新一代的地主统治者. 这就是农民起义几千年来不能推翻封建制度的根本原因. 当封建社会内部的资产阶级和工人阶级这对矛盾统一体由于生产力的发展而壮大时,地主和农民这对矛盾体就会同时逐渐缩小,而最终会为资产阶级和工人阶级这对发展壮大起来的矛盾体所取代.于是, 封建社会转变为资本主义社会.同样,在资本主义社会, 资产阶级和工人阶级也是一对相互需要而又相互对立的阶级. 工人阶级不可能消灭资产阶级后而单独长期存在,以建立一个 “无产阶级专政”的社会.一旦掌握政权后的 “无产阶级”在打倒资产阶级后,其中少数人只能异化为新的资产阶级. 因为任何暴乱和革命不可能使生产力发生质变而产生新的生产关系.在资本主义社会里, 是资产阶级专政和统治工人阶级, 能不能造成一个无产阶级对资产阶级专政的长期稳定的社会制度呢? 这就是马列毛等共产党理论的精髓. 从以前的分析可想而知, 这是一条行不通的乌托邦理论, 这也是共产党上百年革命实践失败的根本原因. 因为当无产阶级剥夺了资产阶级的财产后, 其中的一少部分人一定会利用手中的权力将资产垄断而成为新的资产阶级,即官僚资产阶级. 结果仍然改变不了资产阶级专政的本质. 而这种落后的官僚资产阶级专政制度只能被自由的资本主义制度所取代. 这就是世界上共产党国家蜕变为自由资本主义制度的原因.因此, **只有在资本主义社会的生产力高度发展后,在工农差别城乡差别和地区差别大致消失的情况下, 资本主义社会才能转变为后资本主义社会或初级社会主义社会或社会主义社会.此时, 资产阶级和工人阶级这对矛盾体就会逐步缩小而让位给发展壮大起来的管理阶层和被管理阶层.因此, 社会主义只能从资本主义社会中生成出来,然后发展壮大而逐步取代资本主义,而不是也不**

可能由工人阶级直接消灭资产阶级和资本主义后而建立起 “社会主义社会”..正如资本主义不是也不可能直接消灭封建主义,而是发展壮大后取代封建主义制度一样.

在这种类型的矛盾体中,矛盾的主要方面和次要方面的地位是不可能逆转的或者说转化的,正如一个带正电 e^+ 的质子 p 不可能转变成一个带负电的 e^- 一样.当工人阶级中少部分人有了权力以后,他们绝对不会放弃手中的权力而甘愿再当平凡的工人,他们必然会利用手中得到的权力转换为资本而成为新的资产阶级或资产阶级的代理人. “无产阶级是资产阶级的掘墓人.”这句话是违反社会发展的规律和历史事实的.同样,在历史上农民并没有成为地主阶级的掘墓人, 奴隶也并没有成为奴隶阶级掘墓人.

(B). 同质型矛盾体(差异型, 同性相斥型);矛盾的双方或诸方是由本质和性质相同或类似的矛盾体组成, **双方或各方可以独立地存在,並不同生共灭.它们彼此之间的关系是互相独立地组合在一起**.它们的相互对立和排斥是因为它们同性相斥和互不相容或对某种东西有共同的需要而相互排斥.它们的的相互吸引和并存是因为它们暂时有某些互补性或对对方各有所需或有暂时的力量平衡等.

比如,在钠 Na 原子核外,共有 11 个电子.最内层 2 个电子达到了饱和状态, 第二层 8 电子也达到了饱和状态第三层只有 1 个电子.在内层 2 个电子互相之间与第二层 8 电子互相之间,电子与电子既是同性相斥又有共同需要互相合作组成饱和电子层状态.

再如人与人之间的矛盾,社会集团或财团之间的矛盾, 人民的内部矛盾,军阀甚至国家之间的矛盾等等.矛盾的双方既不一定同生或同灭, 既可相互排斥又可在一定的条件下相互吸引和共存. 双方相互排斥的根源或出于对同一外部事物的需求和争夺或出自单方面要对另一方面的强占和并吞. 而相互依存或吸引则或出自有共同的敌人或力量对比的暂时平衡.**矛盾的单方可以长久独立存在壮大或缩小, 而各方可保持其独有的本性**, 就在一定条件下, 双方或可合并,或可一方吃掉另一方, 或保持相对独立, 或走向永久分离. 一般由许多这类同质矛盾体最终会合并成为强大的一方可成为矛盾的主要方面, 也是外围许多小矛盾体的核心. 而小矛盾体就成为矛盾的次要方面, **与 A 型矛盾不同, B 型矛盾的主要方面和次要方面在一定条件下是可以互换位置和互相转化的.** 如次要方面不被吃掉就会成主要矛盾方面的附庸. **“差异就是矛盾.” 这观念只对同质型矛盾有效.**

同质型矛盾体的性质可以是对抗性的,也可以是非对抗性的, 它们可以为敌或为友, 可非敌非友, 可亦敌亦友, 也可在一定的条件下相互转化. 同质型矛盾体之间产生对抗性矛盾的根源在于一方最终要吃掉另一方. 比如, 强国要侵略弱国, 大鱼吃小鱼, 猫吃老鼠, 大星体吃掉小星体, 老虎要吃人, 人也要吃老虎, 细菌也能吃人, 人杀人, 不同宗教或种族之间的仇杀等等.

毛泽东正确地提出了社会中存在人民内部矛盾和敌我矛盾两种不同类型的矛盾. 而矛盾的性质可分为对抗性的和非对抗性的. **非对抗性矛盾结果是你活我活或者共存共荣. 对抗性矛盾结果是你活我死,或者你死我活,或者你死我也死.** 非对抗性矛盾和对抗性矛盾在一定的条件下可以相互转化. 好的社会政治制度应尽可能化解集体集团或阶层之间产生的对抗性矛盾.在现代社会, 不同宗教或种族之间的矛盾还很难化解.往往激化成对抗性矛盾.

星星和人类的出现, 是在宇宙演化的早期, 宇宙内少数地方能量物质密度稍微大于其外部环境的结果. 也就是说, 该地方的引力或凝聚力高于外部膨胀环境的斥力结果. 换句话说, 比周围环境更团结, 更联合, 更融合,更凝聚才是由许许多多氢原子层层结合进化成人类的必要条件. 因而, 现今文明进步的人类要想能在宇宙中更好的生存和发展, 就只能要更加团结, 相互依存和合作, 而不是像过去野蛮时代一样相互仇恨斗争和残杀. 好的先进的哲学应该是

和合(谐)的哲学, 与天合(和), 与地合(和), 与人合(和). 在解决矛盾中求得团结合作扬弃斗争的哲学. 因为矛盾无须煽动就本已存在. 斗争只能造成分离分裂和分散.所以在社会的非对抗性矛盾中, 斗争只能是手段,团结合作才是目的. 更反对与天斗,与地斗, 与人斗, 其乐无穷, 因为人类本身在宇宙中是渺小的,无节制斗争的结果只能伤害人类本身.因此, “不断革命论”是一个完全错误的理论.从林法则应已过时，不适合现代文明的进步和发展。

比如现在大陆和台湾的统独之争,一看就明白是属于 B 型的同质型矛盾. 二者可不同生不同灭, 互不以对方为自己存在的条件,没有必然的互相依存性.

多极化, 多元化, 多样化和多种经济成分多党合作多边合作等等就是同质型矛盾体存在的各种不同类型的表现.人类要想在地球上长期发展进步,就要与生物界共存共荣.一方面节制人类的过度发展和过度消费,另一方面要保护环境和生物界.

(C). 层级或层次间矛盾:事物结构的发展是分层级的,这是由简单到复杂,由低级到高级,由下层到上层的逐级发展的过程.各个层级或层次之间既互相联系配合,又有各自的性质状态和特殊需要而互相制约以构成一个整体,各层是不可以脱离整体而独立存在. 如各个社会集团,公司, 组织直到政府的组织中的上下级,上下层,领导与被领导, 管理层与被管理层.上层建筑与经济基础,复杂原子中各电子层,硬件与软件,人与自然等.DNA 就是一个极其复杂的由低层向高层发展的层次分明的结构整体,各层次之间既相互依存相互配合又相互竞争相互制约.同样,胚胎在母体从精卵结合到出生的成长过程也是由低层向高层发展的层次分明的发育成长,而各层次结合成一个整体,不可能从整体中单独地脱离和独立出来,各层次之间关系是相辅相成.

我们宇宙从大爆炸诞生约有 137 亿年.在大爆炸后的 3 分钟内,就完成了核合成的任务,产生了最稳定最长寿命的物质--氢原子. 物质在不断地运动发展,经过一系列的变化,首先,经过恒星的产生和超新星的爆炸,合成了所有的元素. 原始地球形成以后的十余亿年间,地球上的无机物 (无生命的物质)产生出有机物 (碳氢化合物和以后的有生命的物质), 即由无机分子生成低分子有机化合物.然后, 由低分子有机化合物生成生物大分子,由生物大分子组成分子体系,进而演变为原始生 命.生命的诞生是物质不断由混沌到有序运动变化的结果.这一变化分为两个阶段.一是在生命系统诞生之前的 “化学进化”阶段,为生命的诞生准备有机材料.二是生命诞生之后,由低级到高级,由简单到复杂的漫长“生物进化”过程.在原始生命的进一 步演变过程中,从最简单的非细胞形态发展为细胞形态,从低等的单细胞生物渐次分化为高等的众多的生物类型,直至出现具有自我意识的人类.因此,天地人具有同一本原,只是在不同情况下发展到不同的层次而已.所以 2500 年前老子所说: “人法地,地法天,天法道,道法自然”就反映了宇宙中不同发展阶段的事物所应当遵循的最基本的依从法则.

在每两个相邻的发展层次中,下层是上层的根基主体并制约着上层的发展的性质方向和规模,上层是下层的发展并对下层有反作用,二者相互依存相互制约.下层比上层简单固实,上层比下层复杂脆弱而多变.所以从下层到上层是发展进化,是有序性增加的过程.

生产力和生产关系的矛盾: 生产力和生产关系的相互作用构成生产方式的矛盾运动.生产力和生产关系是相互制约,相互作用的.生产力决定生产关系,生产力状况决定生产关系的性质和发展.二者之间始 终存在着矛盾,只是在不同时期,其矛盾的性质和特点不同而已.矛盾运动过程是由基本适合到基本不适合再到基本适合,由此推动人类社会从低级 向高级发展. “生产关系的总和构成社会的经济结构.” (马克思)社会经济结构是全部社会生活的现实基础.经济结构直接决定社会的政治结构和文化结构,构成政治结构和文化结构的现实基础。正是在这个意义上,马克思把作为生产关系的总和的经济基础和上层建筑的矛盾, 经济基础

和上层建筑之间的内在的本质的联系,构成了上层建筑一定要适合经济基础发展状况的规律.根据这一规律,上层建筑的性质和变化发展,上层建筑是否需要改革以及改革的形式和方向,都取决于经济基础的状况. 因此,从生产力⇒生产关系⇒社会的经济结构⇒社会的政治结构⇒文化结构.由此可见,这一层又一层地由低层向高层的进化发展是各层次之间矛盾运动的结果.

各个社会集团,公司, 组织直到政府的组织中,都由基层各级中层和最高层所组成.各层之间也是相互依存和相互制约而不能独立存在的矛盾整体.

总结上述层级或层次间矛盾体的特性如下: (1).下层先于上层产生和存在. (2). 二者相互依存相互制约构成矛盾运动变化和发展的整体. (3). 下层是基础, 上层是上层建筑.下层比上层简单固实, 上层比下层复杂脆弱多变. 下层制约上层发展的规模方向,但上层对下层有反相辅相成的作用并对整个事物的发展起促进或阻碍作用. (4). 下层和上层的性质作用地位和次序不可逆转.各层都不能脱离整体而独立存在 (5). 从下层到上层是随时间和外界环境的变化而发展进化的过程, 是有序性增加的过程.当然, 更多的是退化衰亡的过程, 因为宇宙的总熵是增加的.

(D). 个体与其所属(同类)的群体(集体)之间的矛盾: 没有个体,就没有由个体组成的群体(集体).因此**,** 个体与其所属的群体(集体)之间的关系也是对立统一的矛盾体.其表现为个体与群体(集体),个别与一般,个性与共性,个人与集体(组织,团体,阶层,阶级,国家等),树木与森林,宏观与微观之间的矛盾.

当然,在同一个集体中, 一个个体与另一个个体之间的关系构成另一种矛盾体的关系.这种关系即如 B 型所述.因此,此地的 D 型专用于指个体与群体(集体)之间的矛盾.

在我们现今的宇宙中,最简单的氢原子 H 中只有一个单身的负电子 e^-和一个正电子 e^+组成,所以它不稳定而有极强的结合力,结合成氢分子 H_2或其它的化合物. 氢分子 H_2就由 2 个负电子 e^-和 2 个各带一个正电子 e^+的质子组成.而铁原子 Fe 外却有 26 个负电子 e^-.在资产阶级社会,资产阶级和工人阶级都由成千上万的个人组成.

当将一个事物与其相互作用的周围环境一起考察时,也可以看成为 “个体与群体(集体)之间的矛盾”这种类型.

矛盾体中的个体: 在无机界,尚难找出每个个体与其组成的群体之间的特性有显著的区别.比如一个水分子与整个湖水的区别, 一粒盐与整块盐的区别, 一粒铁与整块铁的区别等.(当然,上面所写的各个整体中可包含有其它的杂质).然而,在生物界,每一个生物都有其独特的个性,而与任何一个其它的同类有所不同,有所区别.而同类之间又有共同的性质即共性. 好像一个容器内一个气体分子与容器内所有其它分子的关系一样, 在稳定时都有同一的温度, 即每个分子的平均动能都相等, 这就是共性. 但各个分子的动能又不完全一样, 这就是个性. 正如古人云: “人心之不同,如其面焉”.

在自然界,如上面提到的铁原子 Fe 中,外面的 26 个负电子 e^-.组成 4 个电子层,由内层到外层各层的电子数的顺序为: 2,8,14,2.虽然负电子 e^-不能变成正电子 e^+而进入铁原子核,.但当 X 射线或 γ 射线辐射到物体上时,由于光子能量很高,能穿入物体,使原子内壳层上的被束缚电子发射出来。当一个处于内层电子被移除后,在内壳层上出现空位,而原子外壳层上高能级的电子可能跃迁到这空上,同时释放能量.这就是说,在外力的作用下,电子是可以在各个电子层间跳跃的.但是这种跳跃不可能改变其各个电子层的结构和整个铁原子的属性.

然而, 在社会里,比如在资产阶级社会,每一个资本家和工人个人都有与其它资本家和工人不同的独特个性,也有与其本阶级所共有的阶级共性.但是, 一个资本家和工人个人都有可能

改变自己的地位. 一个工人有可能转变成资本家, 一个资本家也有可能转变成工人.但这种变化改变不了其所在的阶级的本性和整个社会的性质以及资产阶级和工人阶级整体在社会中的原有的地位和性质.

个体虽然有集体的共性,也属于集体.因此,集体与个体的关系是主从关系,主流与支流的关系.但是在生物界中,优越的个体往往会成为该集体的主导或领导.造成优胜劣汰的发展规律.

两种错误的倾向:一种是中国古代的哲学和先哲都只教导人们要独善其身,如何对待天地君亲师等,其实就是处理好个人与个体的关系,而不知道如何去对待集体和组织,用集体和组织的力量去改变社会.所以孔子教导要: “君子群而不党”.但从列宁起到以后的各国共产党为了革命和武装斗争的需要,又强调 “个人一切服从组织”,使个人成为驯服的工具.这些观念都不合时宜和现时代的要求.

4 种不同矛盾体类型的比较

	A 型(双方)	B 型(可多于两方)	C 型(可有多层)	D 型
结构特征	异性相吸,相反相成	同性相斥,混合而不对称	由低向高逐层建立,相辅相成	个体是混于集体中之一员
生存特征	同时生长衰亡	不同生死,可独存独亡	由低向高先后建立发展	集体是个体总和,不共亡
各方关系	双方永结合,不能独立	各方独立组(混)合而成	各层结合发展成整体,不能独立.	个体组成集体,个体可独立
地位转化	双方主次不能转变	各方主次可能转变	各层地位和性质不能改变	集体是主体,个体可成领导
矛盾结局	整体可壮大被替代或消亡	或共存或共亡或一方克服各方	高层随底层衰亡,或高层先衰亡,或整体衰亡.	个体衰亡不是集体衰亡,集体衰亡后个体解散或消失
与其它矛盾关系	可有主次矛盾关系	可有主次矛盾关系和主次矛盾方面	呈 A 型或 B 型	呈 A 型或 B 型

从一个铁原子 Fe 的结构去认识上面的 4 种矛盾类型:在自然界,如上面提到的铁原子 Fe 中,外面的 26 个负电子 e^-.组成 4 个电子层,由内层到外层各层的电子数的顺序为: 2,8,14,2. 因此,所有 26 个外层负电子 e^-与铁原子 Fe 中心的有 26 个正电子 e^+的核构成 A 型矛盾体. 而各层电子中各个电子之间 相互构成 B 型矛盾体.4 层中各层之间构成 C 型矛盾体,最内层由 2 个电子组成,是基层,能级最低而最稳定.各电子层中每个电子与该层所有其它电子组成的整个电子层构成 D 型矛盾体.其中 A 型矛盾代表着铁原子 Fe 的主要结构的稳定和特性. 特别是 2 个外层电子主导着其化学性质---即与其它元素和分子的结合性能,其次是有 14 个电子的次外层.从铁原子还能找出其它类型的矛盾吗?找不到.再来看氢原子,如果将其核中的夸克看成更低一层的结构,同样可以找出氢原子中有 A,B,C,D 四种矛盾类型. 夸克是基本粒子,它是我们现代物理学认知的最底层.至于比原子更复杂的分子,化合物,有机物生物以至人类只不过是具有许多元素和化合物由低层向高层逐级发展而组成出的许许多多的结构层次的事物而已.,而其结构的 A,B,C,D 四种矛盾类型都变得更加复杂而已.因此,不管宇宙中多么复杂的事物而有多么千姿百态的外貌,都不过是许许多多元素和化合物的核外电子层在空间上有序地藕合后所表现出的各种不同的特性而已.

如上所述,混淆矛盾的结构类型将导致重大的错误.

V. 中间态: 事物运动变化和循环过程中的中间态, 量变质变突变和临界点

中间态: 事物内部矛盾体结构在其下限和上限之间的量变过程中并没有改变其本质,随着内部矛盾结构之间的量变,即等比例地扩大或者缩小,而所必然表现出的外部性质和运动状态的量的差异的总和就是其运动变化过程的表现出来**中间态. 正是事物的许许多多的外部表现出的量的差异的总和所组成的中间态才表现出事物的多样性和多彩多姿.这些上下极限**

(两端的临界点)之间的中间态中各种各样量的差异并未打破该事物内部矛盾体之间的平衡和结构的稳定,因而也并没有改变事物的本质.因此,也未否定矛盾律即对立统一规律的普适性. 研究分析事物内部矛盾体结构是从微观研究事物的变化.而研究事物中间态的差异是从宏观观察研究事物的变化.

事物的量变质变和临界点:一个事物往往由许多对矛盾及其所依附的中间体所组成,而该事物之所以相对稳定的存在,在于各对矛盾之间的引力和斥力在其中间体的作用下保持相对的平衡. 在外界作用变化的情况下,每对矛盾之间的引力和斥力的平衡也可在一定的范围内变化(量变)而不改变其内部的主要结构.但这种平衡的变化**有其上限(极限)和下限(极限),--即上下两个临界点.**当事物内部结构诸矛盾体的各方面的量变在其上下极限的范围内时,事物的主要性质和运动状态不会发生质变.只有当外界对该事物的作用使其内部诸矛盾结构之间的相互作用遭到破坏而超过其平衡极限时,就转变为在新条件下内部矛盾体达到新平衡的新结构的事物, 或者因事物受直接冲击而局部损伤或衰退或解体灭亡.

量变与质变的区别并不是绝对的,比如,事物内部一些次要矛盾的量变所产生的质变有时并不改变该事物的主要结构,从而也未改变该事物的主要性质和主要运动形态.

突变: 物体和事物内部或外部直接遭受它物(能量,粒子或物体)的撞(冲)击或刺激,从而使该物体和事物受到部分破坏甚至于整体爆炸解体而消亡,或者使其在较轻微的反复刺激作用下,偶然产生某种突然的进化或者退化过程.这对生物界的进化演变尤其重要. 例如,癌症就是正常细胞的 DNA 在不良因素的反复作用和刺激下发生的突变.这种突变对人来说,就是退化过程.

但无论如何, **所有的突变都是不可逆转的过程.而由量变产生的质变在机机械运动,物理过程和化学反应中是可逆转的过程,而在生物界就演变为不可逆转的过程.**

所有生物个体的产生都是突变的结果,所有的突变都是不可逆转的过程.因此生物的所有进化都是由较轻微的反复刺激产生的突变.而剧烈的突变往往造成生物的衰亡和解体.

(A). 事物运动过程中的中间态: 物质和运动. 没有无物质的运动,也没有无运动的物质. 运动是物质外在的表现形式. 二者是同时存在而又不可分离的.在外界环境(场)的不断作用下,同一物质的相同结构内的量变表现出的性质和运动形态的量的变化和差异是量变.而同一物质的不同结构表现出不同的性质和运动形态是不同的本质. 内部结构在量变的范围内改变时其外部性质和运动形态的量的变化的总和就是其中间态. 在中间态的上下极限就会发生质变.比如,外界温度,压力,引力电磁力(场)的改变导致该物体和事物的温度,压力,速度,颜色,振动的频率和幅度等等不同程度的改变(量变),而呈现出**中间态**.其整体结构也可以在有限的范围内伸缩,这个有限的范围的上下限就是临界点,如物质的临界温度,当水到 100^0C 变成气体,0^0C 变成冰.愈是复杂高级的物体, 其可承受温度变化的范围愈小. 如人是恒温动物,他的体温大约只可承受 6^o 到 10^o C 的温度变化.所有同种成份和结构的物质物体和事物在保持其原有结构和本性的情况下,均可能在有限的范围内改变其特性和运动的程度.除了温度之外,使事物发生量变和质变,破坏,衰亡解体的因素还有许多种,如压力,场引(斥)力,细菌,氧化,腐蚀,冲击,爆炸等等.因此, 同一事物在其内部诸矛盾体的实体结构形式不变的情况下所表现出的形态和运动的不断的量变可以出现和存在介于两个极端之间的许多**中间状态和环节**.它们就是所谓的**灰色地带**(即**中间态**).一个物体可在同时和不同时间有互不干涉和排斥的许多不同状态和运动程度的改变.比如,金属在不同的温度下可能有不同的热胀冷缩,而发出不同颜色的光,半导体在不同外源的激发下能发出不同频率的电磁波.一个人可以在同时和不同时间可以有不同的既有相互联系又有相互矛盾思想和行为.一棵树可有不同颜色

的花,一朵花可以有多种颜色.既然有白天和黑夜,就会有黄昏和黎明.一个人的人性中除了有善和恶的对立面之外,更多的是有许多善多恶少,亦善亦恶的东西. 老子所言: “祸兮福所依,福兮祸所伏.” “祸福无常”, “塞翁失马,焉知非福”,这些都表明人的生活状况具有朝对立面转化的极端趋势,对一个人在通常的情况下来说是处于 “小祸小福”或者 “非祸非福”的中间状态.如果用 “差异就是矛盾”来说明事物的不同特性和不同的运动状态的差别,那就可以理解将 “对立统一规律”普遍用于解释物质(物体)的性质和运动状况的量的差异.如红黄蓝白黑之间,1234567 之间,不同频率的光波和不同频率的光电磁波之间,不同温度之间等等的**诸多量的差异都可以看作为其内部矛盾(对立的统一)结构所容许的量的改变情况下的外部表现.**

物质和运动,粒子与波,质量与能量,本质和现象,内容和形式等, 这些都是事物特有的物质存在形式从不同的角度来看,所表现出的不同的特性和运动形式. 它们之间的同一表现可比如阳光下无条件的形影不离, 它们之间的矛盾表现出影子随时随地都在改变其辉暗,大小和方位---即中间态.当然,形的改变也在影响影像的改变.

(B). 事物变化过程中的中间态: 比如,任何物质物体和事物都有其生长变化和衰亡的过程,包括我们宇宙的诞生和消亡,质子的诞生和衰亡,生命生物和人类的产生和消亡.其它如生物的新陈代谢,社会历史中朝代兴亡更替,新旧生产关系和阶级的交替,战争与和平等.

所有独立存在和存在过的事物总是处于外界环境的包围与作用中.每个事物的内部变化和运动状态的改变,它的生长变化和衰亡都是随外界环境变化所影响和作用的结果. 外界对事物的间接的影响和作用包括温度压力引力电磁力等的变化以及能量的供给和吸取,这种作用往往造成事物内部矛盾体结构的量变或渐变,在一定的限度内,造成该事物的外部主要性质和运动状态没有明显变化的量变. 这些**量变就是事物变化发展过程中的中间态**.没有这些中间态存在和变化,就表示该事物的内部矛盾结构没有随时间的流程而改变, 这就是维持了其内部**原有的平衡和稳定,而保持着原状,即称之为惯性或惯性运动**.因此,对所有生物来说,保持和延缓其内部结构的改变就是延缓其变化的过程,也就是延长其寿命的过程.

但事物变化过程中,当外界对该事物的影响和作用使其内部矛盾体结构的量变或渐变超出所容许的限度时,即其上下临界点时,该事物即发生质变. 使该事物衰亡或转变为新生事物. 当外界对事物的直接的影响和作用是输(射)入和取出粒子(物质) 以及接触碰撞时. 因接触碰撞是突变,往往造成该事物直接的局部损伤甚至于解体和死亡.

任何个体的生盛衰亡都是一个必然规律,这是一个不可逆转和不可还原的过程.但对生物来说,个体生物的死亡可能换取该所属物种的演变或进化.

事物的两重性---是指事物的特性和在运动中的状态同时表现出来的相反特性.如一个人既有优点又有缺点, 有善也有恶,有人性也有兽性.地球有阴阳的两面. 在空间上表现出事物同时存在许多对相反的特性.在时间上也表现出事物在运动变化的过程中先后有许多对相反的特性在不同情况下可以转化.

物极必反,否极泰来---是指事物在运动和演变过程中其本身或其中主要矛盾或其中一方的极度膨胀或衰败导致事物本身走向反面,超出临界点而变成其它事物或死亡.中国 2500 年以前的古老的易经中所讲的阴阳八卦的基本原理就是 “阴极转阳”和 “阳极转阴”的道理.当事物的变化发展到极限即临界点时,即相当于八卦中的从第一爻变化到第六爻的状态时,该事物就会走向反面,变成另外的事物.而在未达到或者超过其极限即临界点前后,就呈现出许多中间态. 八卦中的每一爻都代表事物发展过程中的一个有显著特性的中间状态.而一爻的 “由阴变阳”或 “由阳转阴”就代表具有某一特性的一个中间态转变为另一个中间态.

(C). 事物循环过程中的中间态,事物的循环系统与代代相传:宇宙中绝大多数物体和事物的运动和变化过程都是一环接一环或一代接一代的循环演进过程.地球围绕太阳的周期运转,地球的四季更替,人有悲欢离合,月有阴晴园缺,钟摆运动,一种倾向掩盖着另一种倾向,生物的一代接一代的生死交替,社会生产中的生产分配交换和消费四过程的循环等等.仅有直线运动和变化过程的事物是极少的，是难以长期发展和进化的,而较易走到极端即其反面的.**事物只有在许许多多的循环过程和代代相传的过程中才能有机会遭遇反复的作用和刺激后而产生恰当的反应导致突变或进化或者衰亡.事物在一个循环中的运动和变化是量变,而质变则往往发生在循环的始端和末端.因此, 始端和末端之间的特性和运动状态就是中间态.**事物进化的过程是螺旋式的渐进上升过程.

VI. 一些重要的结论及其分析: 根据上述许多新观点, 我们就可以对下面一系列的众所周知理论或观点重新作出分析和评价并力求得出新的较可靠的结论.

(A). 研究和分析任何一个作为对象的独立事物的内部矛盾时, 过分强调"一分为二", 并将其简单化绝对化,就会导致巨大的错误.因为事物内部不仅仅有诸多矛盾, 而且还有中间体,或者诸多矛盾互为中间体互相依存.这就是事物内部矛盾的同一性. 强调 "一分为二",斗争,不断革命等固然有利于破坏旧事物.但是如果没有认识到旧事物内部诸多矛盾的同一性,那末,破坏旧事物后所建立起来的事物是 "新"还是 "更旧"就不得而知了.因为真正的新事物只能是从原来旧事物内部诸多矛盾中最有发展力的一种发展出来的. 所以,认识同一性就是认识旧事物内诸多矛盾和中间体的存在和各自的作用和发展方向, 就是认识旧事物内诸多矛盾互相依存,就是 "一分为多".这样,就能认识了旧事物发展的方向.这就是要从哲学上了解孔子和亚理士多德都强调走 "中庸之道"的原因.在 1949 年中共中央政府成立以后,在土地改革消灭了旧的地主阶级以后,就否定广大农村会出现新的剥削和压迫的可能性.原来中共在掌权前所倡导的发展资本主义的新民主主义本来是符合当时的国情的,刘少奇的巩固新民主主义而提倡发展资本主义的思想是在旧中国的基础上继续发展进步的正确主张.所以在 1950 到 1953 年这 3 年期间,由于私有经济和自由市场的存在,虽然那时有朝鲜战争,但经济发展和人民生活都是 1980 年改革开放前最好的几年.这表明发展资本主义的私有经济和自由市场是符合和促进当时的生产力的发展水平的.然而变化从 1953 年的农村统购统销开始,接踵而来的是农业合作化,公私合营到 1957 年的反右派,58 年的大跃进,人民公社,甚至搞从社会主义到共产主义的过度.从此 人民生活如同江河日下,而造成 59 到 62 年的大饥荒,以至于饿死数千万人.在文化大革命后期,国民经济跌到了崩溃的边缘.这就清楚的表明 1949 年建国后直到 1976 年之间,生产关系的每次的 "大跃进"就造成生产力的下降.这是那时所执行的毛泽东的一条左倾教条主义路线的结果.资本主义是每一个国家社会必须经历而不可绕过的历史阶段. 只有资本主义的大发展才能使社会生产力大提高,使整个国民经济和人民生活水平随着大提高.当然, 资本主义也有恶性膨胀和危害社会的一面.如果共产党真能始终维护广大人民的利益,是完全可以限制资本主义的恶性膨胀的.毛泽东连帝国主义,苏联修正主义和各国反动派加起来都不怕,难道惟独怕国内的资本主义和资本主义复辟. 其实,毛的高喊阶级斗争, 反资本主义复辟和不断革命论等只不过是用以维护他自己至高无上的权威和地位的走火入魔的托词而已.纵观被他打倒的刘少奇,彭德怀,邓小平,林彪,陈伯达和想打倒而未能打倒的周恩来等都是清廉而生活作风比较正派的,他们中谁像资产阶级?只有一个人更像资产阶级,那就是高岗.而高岗又跟谁最亲近呢?其实,很明显的,当时在打倒地主阶级和 1956 年公私合营后,社会的主要矛盾就是 "一大二公"的生产关系阻碍当时落后的生产力的

发展,在社会生活中就表现为广大无权的群众与坏的变质的党政掌权的官僚之间的矛盾.这是新出现的阶级矛盾的萌芽.1964 年四清时,这就是刘少奇所谓农村 “四清与四不清矛盾”的实质.这也就是文化大革命之所以在广大城市一点就燃而后迅猛发展的真实社会根源.但毛泽东的真实意图并不在于解决当时的实际存在的社会矛盾,而是要逐个打倒他的政见不同者以便为他所属意的亲信接班人扫清接班的道路,以维护他身前的最高权威和身后的 “不朽英名”.结果文化大革命不仅更加破坏和阻碍生产力的发展,使国民经济达到崩溃的边缘.同时更加剧了广大群众与新暴发的掌权者的矛盾,这就导致了 1976 年 4 月 5 日天安门事件的发生和文化大革命的彻底失败.毛泽东用简单粗暴的“一分为二”思想方法将所谓整个社会主义过度阶段归结为无产阶级与资产阶级的阶级斗争和反资本主义复辟,一批一批的打倒他所不合意的所谓 “资产阶级代理人”,而且要社会广大群众跟着他的指示行动.社会经过不断地“一分为二”地 “破”和 “分” 后就了变成一个没有广大中间群众的和近两极对立的社会.因此,这就是孤立的四人帮一夕之间倒台而大快人心甚至没有引起社会小小骚乱的原因.

(B).为什么从斯大林起,共产党内的斗争就如此残酷激烈,非搞得你死我活不可?这就是因为矛盾的类型决定了斗争的性质手段和结果.政治斗争或者说争权夺利的矛盾是 B 类型,在共同敌人弱小或者已被消灭的情况下,就会转变为你死我活的血腥的争权夺利斗争,最典型的就是封建社会的王位争夺.这是比 A 类型的阶级矛盾残酷激烈得多的. 共产党为了夺取政权,往往煽动仇恨,过分誇大阶级间的残酷压迫和剥削.连黄世仁,南霸天,刘文彩的罪恶都被誇大.反观刘少奇,彭德怀连恳求当一个普通农民都不可得,最后受尽无穷的折磨而惨死狱中.A 类型矛盾中的阶级之间矛盾有相互的需求和依赖性的一面, 奴隶主不会将自己的奴隶全部杀光吧. 从社会发展的总的趋势来看,地主和资本家是愈来愈走向文明了. 由此可见, 民主的主要目的是什么?其主要目的不是解决阶级矛盾问题.各公司企业内部有什么民主?不是都照常营运的很好吗?所以民主的主要目的是解决各级政府的权力斗争问题,就是限权,分权,限期交权和监督权,以使争权夺利的斗争特别是高层的权力斗争限制在合理合法的范围内,合乎现代文明的要求.一句话,**民主的主要作用在于尽可能地阻止公共权力的私有和私用，其次是限制资本主义的恶性发展.**现在国际间因为没有有效的民主制度成为游戏规则,所以披着华丽外衣的 “弱肉强食”的 “丛林规则”仍然起着主导作用.由此可见,B 类型矛盾才是产生战争和对抗性矛盾的主要来源.

(C).区分矛盾的类型,正确认识阶级矛盾和社会历史的发展规律.在奴隶社会, 奴隶主和奴隶的矛盾属于 A 型矛盾.奴隶阶级不可能打倒奴隶主阶级后而独立存在.在封建社会, 地主和农民是属于 A 型矛盾. 农民阶级不可能打倒地主阶级后而独立存在.同样,在资本主义社会,资本家和工人阶级也是属于 A 型矛盾, 工人阶级不可能打倒资产阶级后而独立存在并建立一个 “无产阶级专政”的社会. 这些矛盾的主次地位是无法颠倒的. 历史上没有一个阶级推翻其对立的另一个阶级的成功革命的事实.因此,这些矛盾的解决只能是在生产力不断发展的条件下, 一对矛盾的发展壮大去逐渐取代另一对衰退的矛盾而成为社会的一对主要矛盾从而改变生产关系和社会性质.在资本主义社会的生产力高度发展后, **只有在工农差别城乡差别和地区差别大致消失的情况下, 资本主义社会才能转变为后资本主义社会或初级社会主义社会或社会主义社会.此时, 资产阶级和工人阶级这对矛盾体就会逐步缩小而让位给发展壮大起来的管理阶层和被管理阶层**,这主要表现为脑力劳动者和体力劳动者之间的矛盾. 随着社会生产力和文明的高度发展, 脑力劳动和体力劳动之间的矛盾和差别会缩小,但不会

消失.孟子在 2500 年前说过 “劳心者治人, 劳力者治于人.” 这是社会分工的铁规律.因为在后资本主义社会,大多数人都有多余的财产可以买股票或投资而成为资本家.他可以有时做工, 也有有时不做工的自由.因此, 管理者和被管理者就成为社会的普遍现象和产生矛盾的主要来源.如各级政府首脑官员与老百姓的矛盾,公司中经理和各级管理员与职工的矛盾等.因此,社会主义只能从资本主义社会中生长出来,然后发展壮大**.** 在马克思和恩格斯时代,资本家对经济的管理就是尽力加强剥削以便获取最大的利润,管理者和资本家或是一体或依附于资本家而不能独立.因此,马列主义理论中是忽视经济管理的社会作用的.然而,在后资本主义时代,管理者(政治,经济,文化等各部门)已成为经济独立的社会阶层,没有他们的工作,整个社会就无法正常而有效地运转.

(D). 生产力和生产关系这一对矛盾属于 C 型. 生产力是基础, 有先进与落后的区别,生产关系是上层建筑.在中国改革开放前,广大农村还主要是牛耕田的低下生产力条件下,就搞 “人民公社”这种 “一大二公”的社会主义生产关系.这是搞乌托邦,其结果必然是垮台无疑. 按照马克思主义的基本原理, 生产关系对生产力只有适合与不适合的问题,没有先进与落后的区别,适合就促进生产力的发展,不适合就阻碍生产力的发展.中共在 1956 年公私合营(实际上是以小收买的方式消灭资产阶级)后非毛派提出当时社会的主要矛盾是所谓 “先进的生产关系与落户的生产力的矛盾”.这种无阶级斗争的理论当然不合毛的胃口.在毛心里,生产关系越先进,就越能推动生产力的发展.这就是毛搞大跃进遭到失败的原因.他所提倡的 “精神变物质”中的含意大概就是 “先进的生产关系能变成先进的生产力”.而毛泽东则到他 1976 年 9 月死为止就把无产阶级与资产阶级作为社会的主要矛盾,并把所有不满意他和反对他的人都打成资产阶级的代理人, 把所有不满意他和反对他的意见都打成资产阶级右派思想, 并在 1957 年将大批 20 来岁的穷学生和知识分子打成 “资产阶级右派”,其中包括后来当总理的朱熔基.用思想意识来划阶级成份也算是毛泽东把马列主义发展到顶峰了吧.

(E). 个人与集体国家的关系属于 D 类型矛盾.没有个人就没有集体国家.私有制和集体所有制公有制的关系如前者一样也属于 D 类型矛盾.在 1958 年,中国在初创人民公社时,剥夺私人生产工具和几乎所有私人财产,结果是不到 2 年时间,大家就都变得一无所有.马列主义的最终目的是要消灭私有制.现在的问题在于私有制能被最终消灭吗?在阶级社会里, 奴隶,农民和工人阶级之所以受压迫和剥削,并不是由于奴隶主,地主和资本家有财产,而是由于奴隶贫农和工人阶级没有个人财产.因此,当大多数人有了足够多的个人财产时,它们就免除了受压迫和剥削的自由. 在生产力高度发达的后资本主义社会或者初级社会主义社会里,当大多数人有了足够充裕的个人财产时,他们的个人自由,个性解放从必然王国进入自由王国才会较真实地实现.同时**, 在生产力高度发达的后, 个人分工会愈细,交换就愈频繁,个人的成就, 智慧,才能和价值就能较充分实现, 但也只能通过自由市场的交换才能公平地体现出来** 也只有通过自由市场的交换才能提高工作效率,节约资源和成本.有人用 “否定之否定”规律说明私有制最后会被消灭.他们认为从原始公社到阶级社会再到共产主义社会的过程是一个从公有制到私有制再到公有制的过程.然而, 原始公社有生产工具吗?如果有,它们都是大家共有吗?当时的主要的工具其实是个人的一双手.这能成为公共财产吗?当时就没有一点私有物品或食品吗?一支鸟还有自己的鸟巢,何况有思想意识的原始人?

(F). 斯大林毛泽东式社会主义计划经济失败的根本原因是什么? 社会生产中的生产分配交换和消费四过程的循环中,从全社会的总体来说,是生产决定着分配交换和消费.但是分配交换和消费对生产的反作用刺激是巨大的.特别是对个人分配的公正与否.而个人所得到的分配应该按照其个人的才能智慧和创造力对社会的贡献而定.而**人的才能智慧和创造力往往是在较自由的环境下有机遇时突然间爆发出来的**. 斯--毛式计划经济除了将生产分配交换和消费四过程完全按计划统筹安排固定外,却将每个人固定在他所不情愿的环境中不能动弹,以作为驯服的工具或者罗丝钉.只有极少数人在残酷的政治斗争中才能登上政治金字塔的尖顶.这种计划经济是主观的往往是不计成本而低效率的,因为产品的价值和劳动的价值不能在自由交换中实现,因而是无法计划而无竞争力的.所以只能成为一种 “贫穷的社会主义”. **贫穷是产生独裁的最好土壤**.当个体的生产单位和个人(个体,微观)完全服从于国家计划(整体,宏观)时, 个体的生产单位和个人就失去自由和主动性.因此,只有以市场经济为主宏观调控为辅才能使国民经济较得到高速和良性循环的发展.

以上从哲学的观点上分析了斯大林毛泽东式社会主义失败的根本原因,这就是其空想社会主义的三大支柱--即消灭私有制和建立单一的公有制, 消灭资产阶级建立无产阶级专政, 取消市场经济和建立完全的计划经济.而这些都不符合社会经济和历史的发展趋向和规律. 在生产力没有大发展的情形下消灭资本主义是不现实的。现在俄罗斯,东欧国家和中国已抛弃了斯大林毛泽东式社会主义模式, **因为这种社会体制中最大的矛盾是社会主义公有制和权力的私有制,这是一种无法调和的矛盾**.现在俄罗斯,东欧国家和中国已经将社会经济和历史的发展转回到了较正确的方向,所以经济都有较快的发展.

----全文完----

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宇宙永恒吗？

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摘要：按照当代的宇宙论理论，宇宙诞生之前，没有时间，没有空间，也没有物质和能量。大约 200 亿年前，在这四大皆空的"无"中，一个体积无限小的点爆炸了。时空从这一刻开始，物质和能量也由此产生，这就是宇宙创生的大爆炸。现代宇宙论认为，宇宙不可能有无限的过去，而是在某个有限的时间之前诞生的，并在一个有限的将来衰亡。但是，虽然现代宇宙论这样认为，我还是坚信宇宙是永恒的！宇宙从时空上绝对是永恒的！. [New York Science Journal. 2008;1(3):66-69]. (ISSN: 1554-0200).

关键词：宇宙；时间；空间；物质；能量；大爆炸；永恒

1。宇宙的最初三分钟

无论现代宇宙论如何认为，我坚信宇宙是永恒的，时空上绝对是永恒！

按照当代的宇宙论理论，宇宙诞生之前，没有时间，没有空间，也没有物质和能量。大约 200 亿年前，在这四大皆空的"无"中，一个体积无限小的点爆炸了。时空从这一刻开始，物质和能量也由此产生，这就是宇宙创生的大爆炸。 这个点被称为奇点。这个观点虽然在现代宇宙论中占主导，还是有点让人不可思议。

刚刚诞生的宇宙极其炽热致密，随著宇宙的迅速膨胀，其温度迅速下降。最初的 1 秒钟过后，宇宙的温度降到约 100 亿摄氏度，这时的宇宙是由质子、中子和电子等基本离子形成的基本粒子汤。随著宇宙继续变冷，核反应开始发生，生成各种元素。这些物质的微粒相互吸引、融合，形成越来越大的团块，并逐渐演化成星系、恒星和行星，在个别天体上还出现了生命现象，比如地球。然后，能够认识宇宙的人类终于诞生了。

目前宇宙起源的这个大爆炸解释，被称为"大爆炸模型"。大爆炸理论诞生于上世纪 20 年代，在上世纪 40 年代由伽莫夫等人进行补充和发展。

越来越多的证据表明，大爆炸模型在科学上有强大的说服力。虽然我个人更愿意认为宇宙是稳定的、永恒的。但是我看到，现代宇宙学界普遍认为，宇宙有一个开始，也将有一个终结。它产生于"无"，也终将回归于"无"。

2。宇宙有始有终？

在人类历史的大部分时期，有关创世的问题，一向是留给神去解决的，比如现在还被广泛相信的基督教圣经。宇宙起源于何处？终点又在哪里？生命如何产生？人类怎样出现？对这些疑问，许多宗教都能给出一份体系完备的答案。至于上帝从哪里来，所有的宗教都认为这种问题是不该问的。

但是，有一个重大的原则性问题需要面对：宇宙是永恒存在的，还是有起始的？ 这个问题一直困扰著科学家、哲学家和神学家，对于普通人来说，更是难以理解。假设宇宙在时间上没有起源，即过去一直存在，那么宇宙的年龄就是无穷大了。既然是已经过去了无穷久的时间，我们的"现在"又是什么呢？而如果说宇宙是有起始的，那么它就是从"无"中突然产生的了，怎么能从无到有？

大爆炸模型的一个基本假设是宇宙的年龄有限。热力学第二定律认为热量从热的地方流向冷的地方，即任何一个封闭体系的自发过程都是商增过程。就最广泛的意义而言，第二定律认为宇宙的嫡与日俱增。宇宙中每个局部的嫡减少，都须以其它地方的嫡增加为代价。在一个封闭的系统里，嫡总是增大的，一直大到不能再大的程度。这时，系统内部达到一种完全均匀的热动平衡状态，不会再发生任何变化，除非外界对系统提供新的能量。对宇宙来说，不存在外界，因此宇宙一旦到达热动平衡状态，就完全死亡(热寂)。

3。宇宙大爆炸理论

宇宙大爆炸理论认为宇宙有起始，大爆炸模型的提出，是基于上世纪 20 世纪初的天文观测。

上世纪 20 年代，天文学家埃德温哈勃注意到，不同距离的星系发出的光，颜色上稍稍有些差别。远星系的光要比近星系红一些，即波长要长一些，这种现象被称为红移。它说明，各星系正以很高的速度彼此飞离。哈勃对众多星系的光谱进行研究后确认，红移是一种普遍现象，这表明宇宙正在膨胀。这一发现，奠定了现代宇宙学的基础。

如果宇宙正在膨胀，那它过去必定比较小。如果能把宇宙史这部影片倒过来放，我们势必会发现，在过去的某个时刻，所有的星辰都是聚合在一起的。这个时间大概是 200 多亿年前。

另外，宇宙膨胀的速度会随时间发生变化，这与引力有关。万有引力作用于宇宙中一切物质与能量之间，阻止星系往外跑，从而使膨胀速度越来越慢。在诞生初期，宇宙从高密度状态迅速膨胀，随著时间的推移，体积越来越大，膨胀速度越来越小。将这个过程向回追溯到宇宙创生的那一刻，可以发现当时宇宙体积为零，而膨胀速度为无限大。这就是宇宙大爆炸。

大爆炸是空间、时间、物质与能量的起源。这些概念都不能外推到大爆炸之前。大爆炸之前发生了什么、是什么引起了大爆炸，这些问题至今无法回答。

200 亿年前发生了一场大爆炸时，原初宇宙最重要的遗迹倒，是微波背景辐射。按照大爆炸理论，最初的几分钟里，宇宙是一个炽热的火球，到处充满温度高达几十亿度的光辐射。由于此时的宇宙处于热动平衡中，这种辐射具有独特的光谱特征，称为黑体谱。1965 年，贝尔电话公司的两位物理学家彭齐亚斯和威尔逊偶然发现，宇宙确实浸润在一种热辐射之中。这种辐射以相同的强度从空间各个方向射向地球，其温度约为 3 K，谱线具有完美的黑体谱特征。微波背景辐射的发现，是对大爆炸模型最有力的支持。

按照今天宇宙背景辐射的温度，人们认为宇宙诞生后约 1 秒钟各处的温度约为 100 亿度。在如此高温下，宇宙只能由质子、中子和电子等构成。随著宇宙变冷，核反应发生，中子和质子聚合在一起，产生由两个质子、两个中子组成的氦核。氦核形成的过程持续了大约 3 分钟，形成的氦约占宇宙物质总质量的四分之一。这个过程用完了所有的中子，余下的质子就成了氢原子核。

大爆炸模型预言宇宙应当由大约 25％的氦和 75％的氢组成，这与天文测量结果符合。最初三分钟里形成的氢与氦，构成了宇宙中 99％以上的物质。形成行星和生命的丰富多彩的重元素，只占宇宙总质量的不到 1％，它们大部分是在恒星内部形成的。

4。生命

天文观测表明，各种天体的年龄均小于 200 亿年，这与大爆炸理论相吻合。我们的地球大概是 60 亿年前形成的。按照大爆炸模型，宇宙在诞生后不断膨胀，与此同时，物质间的万有引力对膨胀过程进行牵制。如果宇宙的总质量大于某一特定数值，那么总有一天宇宙将在自身引力的作用下收缩，造成与大爆炸相反的大坍塌。如果宇宙总质量小于这一数值，则引力不足以阻止膨胀，宇宙就将永远膨胀下去。

在非常遥远的将来，比如 10^{25} 年以后，宇宙的尺度已经膨胀到如今的 10^{10} 倍，而且还在扩张。在这个系统里，引力虽不足以使膨胀停止，但消耗著系统的能量，使宇宙缓慢地走向衰亡。黑洞在霍金效应的作用下释放出微弱的辐射，最终全

都以热和光的形式蒸发掉。足够长的时间之后，连质子这样稳定的基本粒子也衰变、消亡了，宇宙变成只有光子、中微子及越来越少的电子和正电子。所有这些粒子都在缓慢地运动，彼此越来越远，不会再有任何基本物理过程出现。所有的恒星都燃烧完毕，只有黑洞、中子星等天体。

但是，如果引力足够强大，宇宙可能一天开始收缩。在大尺度上，收缩过程与大爆炸后的膨胀是对称的，像一场倒放的电影。收缩的过程起初很缓慢，随后越来越快。在转折点过后，宇宙的体积开始缩小，背景辐射温度上升。随后，质子和中子也无法区分，挤成一堆由夸克构成的等离子体。在最后的时刻，引力成为占绝对优势的作用力，所有的物质都因挤压不复存在，一切有形的东西，包括空间和时间本身，都被消灭。生命全部死亡，行星、恒星也毁灭，所有物质聚集成很小的体积，这就是宇宙的最后三分钟，这就是宇宙的末日，是一切事物的末日。大爆炸中诞生于无的宇宙，此刻也归于无。无数亿年的时空过程，连一丝信息也不会留下。

现代宇宙论认为，宇宙不可能有无限的过去，而是在某个有限的时间之前诞生的，并在一个有限的将来衰亡。读者们，你们信吗？虽然现代宇宙论这样认为，我还是坚信宇宙是永恒的！宇宙从时空上绝对是永恒的！

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Tolerance of Five Genotypes of Lentil to NaCl-Salinity Stress.

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Abstract: Five Egyptian lentil cultivars ,Giza(4), Giza (9) , Giza (51) ,Giza (370) and Sinai (1), were tested for their tolerance to different levels of NaCl (0,50,100,150,200 and 250 mM). Seed germination, vegetative growth, and activities of certain metabolites were investigated .The inhibitory effects of NaCl differed, depending on the genotypes tested. In Giza(4), Giza(51) and Giza(370), cultivars with reduced germination percentage and lower relative water content, the increase in NaCl concentration resulted in the decrease in growth, levels of photosynthetic pigments, total soluble sugars, total soluble proteins, proline,and activities of the main enzymes involved in the germination process. In contrast, Giza (9) and Sinai(1) cultivars, in response to salt stress accumulated higher proline, total soluble sugar and total soluble proteins concentrations which improved their water status and the enzyme activities . K/Na ratio was varied in the different genotypes in response to different levels of NaCl. Giza(9) and Sinai (1) exhibited highest values of K/Na ratio in their shoots than the other cultivars. [New York Science Journal. 2008;1(3):70-80]. (ISSN: 1554-0200).

Introduction:

The amount and quality of irrigation water available in many of the arid and semi-arid regions of the world are the main limiting factors to the extension of the agriculture (Munns 2002). The progressive salinization of land is one of the most severe world wide problems in agriculture production (Pandey and Thakares, 1997). Soil salinity affected plants at seedling stage much higher than other plant growth stage; because seed germination usually occurs in the uppermost soil layers which accumulate soluble salts as a result of evaporation and capillary rise of water Almansouri *et al.* (2001). Soil salinity designates a condition in which the soluble salt content of the soil reaches a level harmful to crops through the reduced osmotic potential of the soil solution and the toxicity of specific ions. These soluble salts may be from those present in the original soil profile or transported to the profile by irrigation water containing an unusual high concentration (Ates and Tekeli, 2007). All these factors manifest themselves by morphological, physiological and metabolic modifications in plant such as decrease in seed germination, decrease in shoot and root length (Arshi *et al*.2002), alterations in the integrity of cell membranes, changes in different enzymatic activities and photosynthesis (Arshi *et. al*.,2002 and Sairam and Tyagi, 2004).

The response of plants to excess sodium chloride (NaCl) is complex and involves changes in their morphology, physiology and metabolism (Parida and Das,2005).germination is one of the most critical periods for acrop subjected to salinity. In this respect, Fowler (1991) and Puppala *et.al.* (1991) reported that germination failures on saline soils are often the results of high salt concentrations in the seed planting zone because of upward movement of soil solution and subsequent evaporation at the soil surface .These interfere with seed germination and crop establishment. Lentil is considered a strategic crop under agronomic and food point of view, because of its role as possible component of the cropping systems in the Mediterranean areas and as a protein source for human and animal consumption (Kurdali, *et.al*.,1997and Katerji, *et.al*., 2001).

Selection for salinity resistance appears as a laborious and hazardous task and plant breeders are, therefore, seeking for quick, cheap and reliable ways to assess the salt-resistance of selected material. Determination of germination potential of seeds in saline conditions could appear as a simple and useful parameter for several reasons. First, salinity resistance at this stage was shown to be a heritable trait which could be used as an efficient criterion for the selection of salt-resistant populations Ashraf (1994), although it is a polygenic character linked to a complex genetic basis Mano and Takeda (1997). Second, seeds and young seedlings are frequently confronted by much higher salinities than vigorously growing plants because germination usually occurs in surface soils which accumulate soluble salts as a result of evaporation and capillary rise of water.

Several studies demonstrated that the evolution of salinity resistance is not the same for all cultivars of a given species (Lutts *et al.,* 1995 and Almansouri *et al.,* 2001). The aim of this work was to study the effect of salinity on five lentil cultivars for evaluation of their salt tolerance. This was carried out on the basis of magnitude of seed germination, early vegetative growth and activities of some metabolites as well as contents of sodium and potassium during the early stage of growth .

Materials and Methods:

Seeds of lentil Giza(4), Giza (9) , Giza (51) ,Giza (370) and Sinai (1) were obtained from Agricultural Research Centre, Ministry of Agriculture, Giza, Egypt.

A pot experiment was carried out in Botanical farm, Fac. Of Sci., Al-Azhar Univ. seeds were sown in pots 45 cm diameter. Each pot was filled with 10kg of clay loamy soil (40% clay,35% silt, 25% sand) with 10 seeds/pot. Thinning was performed after 1 weak later of germination leaving fiveplants per pot. The pots were divided into five sets representing the five lentil cultivars. Each set composed of five groups representing the following irrigation salinity levels : 0.0,50,100,150,200&250 mM. NaCl.

The relative water content was estimated according to Turner (1981) and was evaluated from the equation:

RWC% = (FW – DW)/(TW)X100, where FW is the fresh weight of the shoots, TW is the weight at full turgor, measured after floating the shoots for 24 hours in water in the light at room temperature and DW is the weight estimated after drying the shoots at 70ºC until a constant weight is achieved.

Photosynthetic pigments were estimated using the method of Vernon and Selly (1966). Contents of soluble carbohydrates were measured according to the method of Umbriet *et al.* (1969). Contents of soluble proteins were estimated according to the methods of Lowery *et al.* (1951).

For determination of proline contents seeds were hand-homogenized in 3% of sulfosalicylic acid and centrifuged at 3000g at 4°C for 10 min. The supernatants were used for proline estimation. Bates *et al.*(1973).

Activities of amylases were determined using the method of Afifi *et al.* (1986). Proteases activities were estimated using the method of Ong and Guacher (1972). Catalases activity were measured according to the method of Chen *et al.* (2000).

A portion of shoot samples (each 0.5 g) were digested with di-acid mixture of HNO_3 and $HClO_4$ (3:1) for K^+, Na^+ analysis (Yoshida *et al.*, 1976). The concentration of K^+ and Na^+ in the digest was estimated by flamephotometery.

Statistical Analysis:

All the obtained results were statistically analyzed using least significant difference test (L.S.D) and (T. Test) at 5% level of probability Snedecor and Cochran (1982).

Results and Discussion:

Germination :

Results of the present study (table 1)revealed that germination of all cultivars began from Two days after sowing, reaching 100% germination percentage in control seeds. Increasing salinity caused delay and a gradual decrease in germination. This was valid among the different cultivars. At the seventh day after sowing (before thinning the plants in pots) the final germination percentage for each of the studied cultivars was calculated. The seeds were not germinated by the 250 mM salinity level. However, at 200 mM NaCl, germination percentage was significantly reduced in Giza-4 (50%) ,and Giza-51which retched 39% and 10% in Giza-370. At the same salinity level (200 mM NaCl) cultivars Giza-9 and Sinai-1 germinated more than the other ones (77and 64%), exhibiting a fair degree of salt tolerance. In general the obtained results show a decrease in germination percentage in all studied genotypes, with increasing salinity. In the cultivars Giza-4 ,Giza-370 and, in minor extent, in Giza-51 the magnitudes of such decrease were more as compared to that of cultivars Giza-9 and Sinai-1,in particular way when high salinity concentrations were used. Inhibition of germination due to salinity has been reported (Alyari, *et al.*,2004 and Redondo,*et al.*2004). Sidari *et al.* (2008) reported that genetic variability within a species offers a valuable tool for studying mechanism of salt tolerance. Germination process can be considered in terms of three sequential steps: imbibition, metabolism leading to initiation of radical growth and radicle growth leading to radical emergence.

Table 1 : Germination percentage (%) of five lentil cultivars under different levels of NaCl.Each value is a mean of three replicats ± standard error of mean .

	NaCl Concentrations (mM)					
Cultivar	0.0	50	100	150	200	250
Giza-4	100.0 ± 0.0	100.0 ± 0.0	71.25 ± 0.04**	56.39± 0.06**	50.21 ± 0.06**	_
Giza-9	100.0 ± 0.0	100.0 ± 0.0	92.34 ± 0.06*	82.13 ± 0.04**	77.05± 0.03**	_
Giza-51	100.0 ± 0.0	97.12 ± 0.10	73.24 ± 0.07**	51.52± 0.06**	39.11± 0.08**	_
Giza-370	100.0 ± 0.0	94.08 ± 0.06	68.27± 0.06**	48.64 ± 0.04**	10.00 ± 0.07**	_
Sinai-1	100.0 ± 0.0	100.0 ± 0.0	87.21 ± 0.04**	76.27 ± 0.05**	64.13± 0.07**	_

* Significant at 5% confidence level;
** Significant at 1% confidence level.

Growth and metabolic responses:

Depending on the obtained results as regards the percent of germination, four levels of salinity (0.0,50,100&150 mM NaCl) were tested for growth and metabolic responses of the five cultivars of lentil. Data presented in table 2 showed that salinity decreased plant height, as well as plant- fresh and dry weights of the tested cultivars . The magnitude of decrease was increased with increasing salinity level. Statistically,Giza(9) and Sinai(1) cultivars showed insignificant responses as regard the aforemintioned growth parameters. This was the case up to100 mM NaCl then they were significantly decreased. Other cultivars showed either significant or highly significant decreases in growth characters in response to all applied levels of salinity except for 50 mM NaCl , they were insignificantly affected.

Reults presented in table 2 showed that increasing salinity level led to a gradual decrease in the RWC in all cultivars. The highest water content was detected in cultivar Giza-9 followed by Sinai-1 , while the lowest contents were detected in Giza-4 , Giza-51 and Giza-370 respectevely. This was the case troughout the different levels of NaCl. Relative water content (RWC) was used as a measure of drought (McCaig and Romagosa, 1991). Inhibition of germination due to salinity as suggested in previous reports (Ates and Tekeli ,2007 and Sidari *et al.* 2008) is attributed to a decrease water content, that affect the synthesis of hydrolitic enzymes limiting the hydrolysis of food reserves from storage tissues as well as to impaired translocation of food reserves from storage tissue to developing embryo axis (Dubey ,2003).

Reults presented in table 2 showed also that increasing salinity level led to a decrease in the K/Na ratio in all cultivars.Progressive decrease in the K/Na ratio were observed in Giza-4 , Giza-51 and Giza-370 respectevely. This was more obvious at the high levels of NaCl . On the other hand,highest levels of K/Na ratio was detected in cultivar Giza-9 followed by Sinai-1. This was the case troughout the different levels of NaCl. K^+/Na^+ ratio is a good indicator to assess plant tolerance to salt stress (Ashraf,*et.al.*, 2007).They reported that reduction in K^+/Na^+ ratio of sugarcane genotypes under salt stress was attributed to increased absorption of Na^+ and decreased absorption of K^+ by sugarcane genotypes. However, salt-tolerant genotypes exhibited strong affinity for K^+ over Na^+ and maintained an 8-fold higher K^+/Na^+ ratio as compared to salt-sensitive genotypes.

Table 2: Effect of different levels of NaCl on plant height(cm.),F.wt. (gm./plant),D.wt. (gm./plant), RWC(%/plant) and K^+/ Na^+Per plant of five lentil cultivars . Each value is a mean of three replicats ± standard error of mean .

Cultivars	NaCl (mM)	plant height (cm.)	F.wt. gm./plant	D.wt. gm./plant	RWC% Per plant	K/Na ratio Per plant
Giza-4	0.0	24.11 ± 0.12	3.25 ± 0.10	1.17 ± 0.02	47.06 ± 1.02	3.29 + 0.01
	50	23.98 ± 0.14	3.09 ± 0.01*	1.14 ± 0.03	46.10 ± 1.12	3.01 + 0.04
	100	18.24 ± 0.12**	2.17 ± 0.12**	1.09 ± 0.02*	33.13 ± 0.19**	2.36 + 0.02**
	150	13.27 ± 0.24**	2.01 ± 0.04**	1.03 ± 0.02**	31.21 ± 0.54**	0.57 + 0.02**
Giza-9	0.0	26.25 ± 0.16	3.69 ± 0.16	1.18 ± 0.01	48.49 ± 0.35	3.31 + 0.04
	50	26.02 ± 0.13	3.38 ± 0.08	1.11 ± 0.05	50.56 ± 0.84	3.24 + 0.06
	100	23.17 ± 0.10	3.01 ± 0.07	1.09± 0.01	47.91 ± 0.73	3.19 + 0.03
	150	21.91 ± 0.15*	2.98 ± 0.23	1.08 ± 0.02	48.63 ± 0.29	2.93 + 0.07
Giza-51	0.0	25.36 ± 0.13	3.18 ± 0.15	1.14 ± 0.03	47.23 ± 0.53	3.16 + 0.04
	50	22.40 ± 0.08	2.57 ± 0.06*	1.10 ± 0.01	40.57 ± 0.81	2.58 + 0.06
	100	17.14 ± 0.13**	2.45 ± 0.07**	1.07 ± 0.01*	39.27 ± 0.09**	1.27 + 0.03**
	150	15.39 ± 0.13**	2.26 ± 0.05**	1.08 ± 0.01*	35.61 ± 0.38**	0.97 + 0.08**
Giza-370	0.0	25.37 ± 0.20	3.41 ± 0.07	1.11 ± 0.04	50.98 ± 0.94	3.12 + 0.02
	50	22.34 ± 0.14*	3.16 ± 0.04	1.13 ± 0.01	47.54 ± 0.82	2.09 + 0.04*
	100	19.30 ± 0.10**	2.70 ± .03**	1.09 ± 0.03	43.66 ± 0.37*	1.20 + 0.06**
	150	14.21 ± 0.08**	1.89 ± 0.04**	1.00 ± 0.02**	30.79 ± 0.77**	0.57 + 0.09**
Sinai-1	0.0	25.69 ± 0.14	3.51 ± 0.08	1.09 ± 0.02	52.60 ± 0.18	3.24 + 0.04
	50	25.02 ± 0.12	3.47 ± 0.05	1.04 ± 0.00	53.46 ± 1.06	3.05 + 0.01
	100	21.95 ± 0.16	3.42 ± 0.07	1.04 ± 0.01	53.33 ± 0.38	2.81 + 0.04
	150	20.34 ± 0.17*	3.00 ± 0.10	1.03 ± 0.03	47.25 ± 0.11	2.79 + 0.08

* Significant at 5% confidence level;
** Significant at 1% confidence level.

Results of the present study(table 3) showed a great variations as regards the contents of photosynthetic pigments depending on the type of lentil cultivar and the applied level of NaCl. Cultivars of Giza-4 , Giza-51 and Giza-370 showed ,in most cases, highly significant decreases in the contents of chlorophyll a , chlorophyll b and carotenoids especially at the high salinity levels. In cultivar Giza-9 followed by Sinai-1, contents of chlorophyll a, chlorophyll b as well as carotenoid contents were generaly insignificantly affected in response to different applied levels of salinity.

Several investigators reported that chlorophyll and total carotenoid contents of leaves decrease, in general, under salt stress. The ability of plants to tolerate salt is determined by multiple biochemical pathways that facilitate retention and/or acquision of water, protect chloroplast function and maintain ion homeostasis (Parida and Das, 2005). In Grevilea, protochlorophyll, chlorophylls, and carotenoids are significantly reduced under NaCl stress, but the rate of decline of protochlorophyll and chlorophyll is greater than that of Chl-a and carotenoids (Kennedy and De Fillippis, 1999). In leaves of tomato, the contents of total chlorophyll (Chl.a+b), Chl-a, and b carotene decrease by NaCl stress (Khavarinejad and Mostofi, 1998). Under salinity stress, leaf pigments studied in nine genotypes of rice reduce in general, but relatively high pigment levels are found in six genotypes (Alamgir and Ali, 1999). Salinity causes significant decreases in Chl-a, Chl-b, and carotenoid in leaves of *B. parviflora* (Parida *et al.*, 2002). Decrease in carotenoids lead to degradation of B-carotene and formation of Zeaxanthins, which are apparently involved in protection against photoenhibition Sharma and Hall (1991). .However, Wang and Nil (2000) have reported that chlorophyll content increases under conditions of salinity in *Amaranthus* plants.

Table 3: Effect of different levels of NaCl on contents of Chlo.a,mg/g. F.wt., Chlo.b,mg/g. F.wt.and contents of Carotenoids mg/g.F.wt. of five lentil cultivars . Each value is a mean of three replicats ± standard error of mean.

Carotenoids mg/g.F.wt.	Chlo.b,mg/g. F.wt.	Chlo.a,mg/g. F.wt.	Treatments Cultivars	NaCl mM.
2.21 ± 0.01	3.09 ± 0.01	3.21 ± 0.03		0.0
2.14 ± 0.05	2.89 ± 0.04	3.11 ± 0.02	Giza-4	50
1.64 ± 0.03**	1.39 ± 0.03**	2.61 ± 0.05*		100
1.07± 0.02**	1.09 ± 0.01**	2.01 ± 0.02**		150
2.33 ± 0.05	3.19 ± 0.01	3.35 ± 0.04		0.0
3.33 ± 0.01**	3.09 ± 0.06	3.33 ± 0.01	Giza-9	50
2.17± 0.05	2.89 ± 0.02	3.19 ± 0.05		100
2.24 ± 0.07	2.81 ± 0.05	2.94 ± 0.03		150
2.84 ± 0.02	3.12 ± 0.03	3.14 ± 0.02		0.0
3.02 ± 0.06	3.09 ± 0.01	3.01 ± 0.04	Giza-51	50
2.74 ± 0.03	2.19 ± 0.04**	2.13 ± 0.04**		100
1.74 ± 0.02**	2.09 ± 0.06**	1.47 ± 0.02**		150
2.09 ± 0.01	3.06 ± 0.01	3.09 ± 0.04		0.0
3.01 ± 0.02*	3.00± 0.08	3.01 ± 0.02	Giza-370	50
1.28 ± 0.04**	2.10 ± 0.02**	2.31 ± 0.05*		100
1.17 ± 0.02**	2.04 ± 0.05**	1.11 ± 0.02**		150
2.40 ± 0.04	3.10 ± 0.03	3.40 ± 0.05		0.0
3.00 ± 0.02*	3.06 ± 0.01	3.01 ± 0.02	Sinai-1	50
3.01 ± 0.02*	2.79 ± 0.02	3.01 ± 0.03		100
2.94 ± 0.03*	2.09 ± 0.04*	2.84 ± 0.02		150

* Significant at 5% confidence level;
** Significant at 1% confidence level.

The obtained results (table 4) revealed that contents of soluble carbohydrates in shoots of different cultivars were greatly affected in response to different levels of salinity. In Giza-4, Giza-51and Giza- 370 , contents of soluble carbohydrates in both shoots and roots were increased at the lower level of NaCl(50mM) , then they were significantly decreased at the higher levels (150mM NaCl). However, in Giza-9 followed by Sinai-1 , an opposite trend was observed,where contents of soluble carbohydrates in shoots and roots were increased with increasing salinity level. Statistically , the observed increases were found to be significant up to 100 mM of NaCl then they were insignificantly affected at 150 mM NaCl. Carbohydrates such as sugars (glucose, fructose, sucrose, fructans) and starch accumulate under salt stress (Parida *et al.*, 2002). Their major functions are osmoprotection, osmotic adjustment, carbon storage, and radical scavenging. Salt stress increases reducing sugars (glucose, fructose), sucrose, and fructans in a number of plants (Kerepesi and Galiba, 2000; Khatkar and Kuhad, 2000; Singh *et al.*, 2000). In Vicia faba salinity decreases soluble and hydrolyzable sugars (Gadallah, 1999). Sugar content increases in some genotypes of rice but also decreases in some genotypes (Alamgir and Ali, 1999). Under salinity, the starch content in roots of rice plants declines and remains unchanged in shoots. A decrease in starch content and an increase in both reducing and nonreducing sugar have been reported in leaves of Bruguiera parviflora (Parida *et al.*, 2002). Sidari *et al.* (2008) in lentil, indicate a lower content of total soluble sugar and proline in presence of the highest salt concentration in Castelluccio and Eston cultivars compared to Ustica and Pantelleria cultivars, suggesting that salt tolerance ability of these two last landraces appears to be associated to the accumulation of osmolytes which improved their water status.

Data presented in table 4 revealed that contents of soluble protein were significantly increaced in shoots of Giza-9 and sinai-1

cultivars in response to all applied concentrations of NaCl. In Giza 51, contents of soluble proteins were increased only at the lower level of NaCl(50mM), then they were significantly decreased at 100 &150 mM NaCl. Highly significant decreases in protein contents were detected in shoots of Giza-4 and Giza 370 cultivars. This was the case throughout all the applied levels of NaCl. Several salt-induced proteins have been identified in plants species and have been classified into two distinct groups (Mansour, 2000) , salt stress proteins which accumulate only due to salt stress, and stress associated proteins, which also accumulate in response to heat, cold, drought, waterlogging, and high and low mineral nutrients. Proteins that accumulate in plants grown under saline conditions may provide a storage form of nitrogen that is re-utilized when stress is over (Singh *et al*.,1987) and may play a role in osmotic adjustment. Proteins may be synthesized de novo in response to salt stress or may be present constitutively at low concentration and increase when plants are exposed to salt stress (Pareek *et al*., 1997). A higher content of soluble proteins has been observed in salt tolerant than in salt sensitive cultivars of barley Hurkman *et al*.,1989, finger millet (Uma *et al*., 1995), and rice (Lutts *et al*.,1996). In wheat, Ashraf and O'Leary (1999) reported that total soluble proteins increased due to salt stress in all cultivars tested but that this increase was more marked in a salt sensitive cultivar and low in a salt tolerant. In contrast, in lentil, Ashraf and Waheed (1993) reported that leaf soluble proteins decreased due to salt stress in all lines, irrespective of their salt tolerance. Ashraf and Fatima (1995) found that salt tolerant and salt sensitive accessions of safflower did not differ significantly in leaf soluble proteins. Similarly, comparison of salt tolerant wild populations with cultivated populations of *Melilotus indica* and *Eruca sativa*, Ashraf (1994) showed that the salt tolerant populations did not differ from salt sensitive populations in soluble protein content of their leaves at varying salt levels of the growth medium.

Table 4: Effect of different levels of NaCl on contents of Soluble carbohydrates (mg/g. D.wt.), Soluble prteins (mg/g. D.wt.)and contents of Proline(mg/g.D.wt.) in shoots of five lentil cultivars . Each value is a mean of three replicats ± standard error of mean.

Proline mg./g. D.wt.	Soluble prteins mg/g. D.wt.	Soluble carbohydrates mg/g. D.wt.	Treatments Cultivars	NaCl (mM)
0.53 ± 0.01	61.95 + 0.24	56.27 ± 0.12		0.0
0.79 ± 0.02*	66.32 + 0.28*	54.19 ± 0.14	Giza-4	50
0.52 ± 0.01	55.09 + 0.30**	43.28 ± 0.21**		100
0.34 ± 0.05**	53.27 + 0.16**	41.91 ± 0.15**		150
0.61 ± 0.02	63.05 + 0.24	57.28 ± 0.13		0.0
0.87 ± 0.04*	67.91 + 0.22*	62.27 ± 0.14*	Giza-9	50
0.93 ± 0.03**	73.68 + 0.17**	74.09 ± 0.14**		00
0.94 ± 0.02**	77.15 + 0.24**	74.60 ± 0.20**		50
0.56 ± 0.04	60.58 + 0.14	55.92 ± 0.15		0.0
0.67 ± 0.01*	61.24 + 0.12	51.36 ± 0.18*	Giza-51	50
0.41 ± 0.03*	54.10 + 0.16**	43.50 ± 0.15**		100
0.37 ± 0.04**	49.88 + 0.15**	39.20 ± 0.14**		150
0.58 ± 0.04	61.05 + 0.17	56.38 ± 0.18		0.0
0.55 ± 0.05	58.20 + 0.14	57.25 ± 0.15	Giza-370	50
0.41 ± 0.01**	49.26 + 0.25**	42.60 ± 0.30**		100
0.35 ± 0.04**	45.57 + 0.34**	36.81 ± 0.15**		150
0.56 ± 0.02	62.28 + 0.17	54.96 ± 0.17		0.0
0.61 ± 0.06*	67.24 + 0.23*	66.10 ± 0.14**	Sinai-1	50
0.67 ± 0.03**	70.34 + 0.19**	73.31 ± 0.18**		100
0.78 ± 0.02**	70.94 + 0.16**	75.90 ± 0.12**		150

* Significant at 5% confidence level;

** Significant at 1% confidence level .

Reults in table 4 showed that contents of proline in shoots of the tested cultivars were varied greatly according to the type of cultivar and the applied concetration of NaCl . In Giza-9 and,to more extent, in sinai-1, proline contants were increased with increasing salinity level. However in other cultivars, contants of proline were, generally, decreased with increasing salinity level. Accumulation of some compatible solutes (proline and free amino acids) in stressed plants produced lower solute potential , which allows plant cell to maintain a higher water content than the corresponding control. These solutes play an important role in plants under stress conditions, where major functions of sugars are osmoprotection and/or osmotic adjustment as reported by Parida *et al*.(2002).

Results presented in table 5 revealed that activities of amylases,proteases and catalases in shoots of the tested cultivars were varied greatly according to the type of cultivar and the applied concetration of NaCl . In Giza-9 and, to more extent, in sinai-1, activities of amylases and proteases were mostly insignificantly affected in response to the different levels of salinity,while activities of catalases were significantly increased. In other cultivars, Giza-4, Giza-51and Giza- 370 , activities of amylases,proteases and catalases were decreased. The magnitude of the decreases was increased with increasing salinity level. The activities of the antioxidative enzymes such as catalase (CAT), increase under salt stress in plants and a correlation of these enzyme levels and salt tolerance exists (Lee et al., 2001; Mittova et al., 2003 and Parida and Das, 2005).Vardhini and Rao (2003) observed that CAT activity decreased in susceptible sorghum and maize varieties but increased in resistant varieties as compared to unstressed control plants.

Conclusion:

Although lentil is considered a very sensitive species to salinity, much more than other legumes such as broad bean, chick pea and soybean, from the outcom of the obtained results ,it could be identified , at least , two cultivars, Giza(9) and Sinai(1) that could be utilized not only in breeding programs to improve the saline resistance of the species but also to be cultivated in environments where salinity of the soils is a frequent constraint.

Table 5: Effect of different levels of NaCl on contents of amylase (mg/g. F.wt.), prtease (mg/g. F.wt.) and contents of catalase (mg/g.F.wt.) in shoots of five lentil cultivars . Each value is a mean of three replicats ± standard error of mean.

Catalase mg/g.F.wt.	Protease mg/g.F.wt.	Amylase mg/g.F.wt.	Treatments Cultivars	NaCl, mM
2.21 ± 0.01	3.09 ± 0.01	3.21 ± 0.03		0.0
2.14 ± 0.05	2.89 ± 0.04	3.11 ± 0.02	Giza-4	50
1.64 ± 0.03**	1.39 ± 0.03**	2.61 ± 0.05*		100
1.07± 0.02**	1.09 ± 0.01**	2.01 ± 0.02**		150
2.33 ± 0.05	3.19 ± 0.01	3.35 ± 0.04		0.0
3.33 ± 0.01**	3.09 ± 0.06	3.33 ± 0.01	Giza-9	50
2.87± 0.05*	2.89 ± 0.02	3.19 ± 0.05		100
2.84 ± 0.07*	2.81 ± 0.05*	2.94 ± 0.03		150
2.84 ± 0.02	3.12 ± 0.03	3.14 ± 0.02		0.0
3.02 ± 0.06	3.09 ± 0.01	3.01 ± 0.04	Giza-51	50
2.74 ± 0.03	2.19 ± 0.04**	2.13 ± 0.04**		100
1.74 ± 0.02**	2.09 ± 0.06**	1.47 ± 0.02**		150
2.09 ± 0.01	3.06 ± 0.01	3.09 ± 0.04		0.0
3.01 ± 0.02	3.00± 0.08	3.01 ± 0.02	Giza-370	50
1.28 ± 0.04**	2.10 ± 0.02**	2.31 ± 0.05*		100
1.17 ± 0.02**	2.04 ± 0.05**	1.11 ± 0.02**		150
2.40 ± 0.04	3.10 ± 0.03	3.40 ± 0.05		0.0
3.00 ± 0.02*	3.06 ± 0.01	3.01 ± 0.02	Sinai-1	50
3.01 ± 0.02*	2.79 ± 0.02	3.01 ± 0.03		100
2.94 ± 0.03*	2.09 ± 0.04*	2.84 ± 0.02		150

* Significant at 5% confidence level;
** Significant at 1% confidence level.

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ISSN: 1554-0200

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ISSN 1554-0200

Marsland Press

Brooklyn, New York, the United States

ISSN 1554-0200