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(2) Abstract: including Background, Materials and Methods, Results, and Discussions.

(3) Key Words.

(4) Introduction.

(5) Materials and Methods.

(6) Results.

(7) Discussions.

(8) References.

(9) Acknowledgments.

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Cover Page, Introduction, Contents, Call for Papers, All papers in one file

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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. [Academia Arena, 2009;1(2):1-9]. ISSN 1553-992X.

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１００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,只能蕲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.

----全文完---

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The new concept to the changes of social economic conformation and the development of human society

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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。[Academia Arena, 2008;1(2):10-15]. ISSN 1553-992X.

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

Definition, selection, freedom and occasionality of philosophy

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Keywords: definition; selection; freedom; occasionality; philosophy

“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.

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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----

The scientific gist and construction type of "law of opposite and unification"

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贝尔不等式与布尔代数

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内容提要：对于量子力学来说，经典概率论是不必要的。但是，如果有人硬是把经典概率论应用于微观物理学将会得到什么样的结果呢？是一定会与量子力学相矛盾呢？还是相反，在某种条件下经典概率论也会与量子力学殊途同归呢？迄今为止，没有人考察过这一问题，从而与该问题相关的领域在微观物理学形成了一个盲区。当问题涉及量子力学与经典物理学之间的关系时，人们就难免会在这个盲区里误入歧途，贝尔定理就是一个典型的例子。

贝尔定理的证明多种多样，但万变不离其宗，这些证明都用到经典概率论，特别是用到其中的关于“联合概率”的运算规则，这些规则是否适用于贝尔所考察的过程的问题，刚好落在这个微观物理学的盲区之内。人们在这里不自觉地遵循如下准则：当他们从量子力学的角度考虑问题时，默认这些规则全都不适用于微观过程，当他们从定域隐变量理论的角度考虑问题时，又默认这些规则全都适用于微观过程。贝尔定理就是这种荒谬的准则的产物。

在贝尔定理的证明中，那些被认为表现了“定域隐变量理论”特征的命题，可以归结为自旋相关函数的一个“经典表达式”，但绝不是这个表达式导致贝尔不等式。理由有二：第一，从这个表达式可以导出量子力学的自旋相关公式；第二，在导出贝尔不等式时，还用到了一个隐蔽的命题，从而用到了经典概率论的事件运算规则，即布尔代数的规则。由此得出结论：贝尔不等式之所以与量子力学相矛盾，既与定域性原理无关，也与隐变量理论无关；只不过是因为人们在推导它时，曾经对“非布尔”的微观事件空间应用了布尔代数的运算规则。[Academia Arena, 2009;1(3):32-42]. ISSN 1553-992X.

关键词：贝尔不等式；定域性原理；隐变量理论；自旋相关公式；经典概率论；联合概率；布尔代数；概率运算；事件运算；量子力学

1. 引言

1964 年，J. S. 贝尔在一份名为《物理》的杂志的创刊号上，发表了题为《论 EPR 佯谬》的论文，提出了“贝尔定理”，其原始形式是：

“在一个在量子力学上增添一些参量以确定单次测量的结果而又不改变其统计预言的理论中，必须有某种机制，使得一个测量仪器的安置会影响另一个仪器的读数，不

论它们相距多么遥远。此外，所用的信号必须是瞬时传播的，因此这样的理论不可能是洛仑兹不变的。”

在这里，所谓“在量子力学上增添一些参量以确定单次测量的结果的理论”就是“隐变量理论”。另一方面，按照“定域性原理”，当两个测量仪器相距足够远时，一个测量仪器的安置不可能影响另一个仪器的读数。因此，贝尔的上述结论可表成：“如果一个隐变量理论不改变量子力学的统计预言，就一定会违背定域性原理。”或者说：“如果一个隐变量理论遵循定域性原理，就一定会改变量子力学的统计预言。”人们把遵循定域性原理的隐变量理论称为“定域隐变量理论”，于是，贝尔定理最终表成现在常见的形式：“任何定域隐变量理论不可能重复量子力学的全部统计预言。”

因为“实在论”被认为是隐变量理论的哲学前提，从而所谓“定域实在论”（满足“定域性原理”的“实在论”）被认为是“定域隐变量理论”的哲学前提。因此，人们根据贝尔定理得出结论：量子力学与“定域实在论”相互排斥。同时人们还得出结论：可以用实验来判断量子力学与“定域实在论”孰是孰非，从而在物理学史上，开了一个通过物理实验来检验哲学观点的先例。

因此，贝尔定理对物理学的影响极为深远，1973 年诺贝尔物理奖得主约瑟夫森把它称为“物理学中最重要的新进展”，物理哲学家斯塔普则把它称作“科学中最深刻的发现”。

在本文中，我们将给出贝尔不等式的一种新推导，并重新认识贝尔定理。

2. 自旋相关函数的经典表达式

量子力学伴随着一种新的概率计算程式，对应地，原来的概率计算程式就被称为“经典概率论”。对于量子力学来说，经典概率论是不必要的。但是，如果有人硬是把经典概率论应用于微观物理学将会得到什么样的结果呢？是一定会与量子力学相矛盾，还是相反，在某种条件下经典概率论也会与量子力学殊途同归呢？这个问题并不艰深，可是由于人们一直不屑于思考它，迄今为止，与这一问题相关的领域还是微观物理学的一个盲区。对于量子力学自身的发展来说，这个盲区的存在并不碍事，但当问题涉及量子力学与经典物理学之间的关系时，人们就难免会在这个盲区里误入歧途，贝尔定理就是一个典型的例子。

贝尔定理的证明多种多样，但万变不离其宗，这些证明都用到经典概率论，特别是用到其中的关于“联合概率”的运算规则，这些规则既不属于量子力学，也不是定域隐变量理论的组成部分。因此，在没有弄清楚这些规则是否适用于微观过程之前，无论从量子力学出发还是从定域隐变量理论出发，都不能应用它们。不幸的是，关于这些运算规则是否适用微观过程的问题，刚好落在这个微观物理学的盲区之内。因此贝尔定理的

研究引导物理学家们走进了该盲区，人们在这里不自觉地遵循如下准则：当他们从量子力学的角度考虑问题时，默认这些规则全都不适用于微观过程，当他们从定域隐变量理论的角度考虑问题时，又默认这些规则全都适用于微观过程。为了澄清由这一荒谬的准则所引起的混乱，现在我们就来考察经典概率论的运算规则是否适用于微观过程的问题，先考察一个特殊的联合概率。

实验证明：如果一个电子束（或其他自旋 1/2 的粒子束）L经过一个磁场方向为**a**的斯特恩 - 革拉赫装置G_a，将被分裂为两束，其中一束向**a**方向偏转，另一束则向–**a**方向偏转。这个实验事实表明：电子自旋（电子的角动量）沿磁场方向的投影只能取两个值，以 ħ /2 为单位，这两个值分别是 1 和–1。用σ_a表示电子束L中的某一电子的自旋沿**a**方向的投影，则测量的结果要么是 $\sigma_a = 1$，要么是 $\sigma_a = -1$。其中测量结果为$\sigma_a = 1$ 的诸电子形成一个新的电子束A，让它再经过一个磁场方向为**b**的斯特恩 - 革拉赫装置G_b，则它将再次分裂为两束，其中一束的自旋的测量值为 $\sigma_b = 1$；另一束为 $\sigma_b = -1$。如果电子束A有N个电子，其中有pN个在G_b中的测量结果为 $\sigma_b = 1$，则实验证明，当N足够大时，p的取值与N无关。根据概率的频率定义，p是A中的某一单个电子在其初态是 $\sigma_a = 1$ 的条件下，经过G_b，达到终态 $\sigma_b = 1$ 的概率，这是一个“条件概率”，我们把它记作$\Pr(\sigma_b = 1|\sigma_a = 1)$。一般地说，对于 $x,y \in \{1, -1\}$（即x与y要么是 1 要么是–1），$\Pr(\sigma_b = y|\sigma_a = x)$ 是A中的单个电子从 $\sigma_a = x$态“跃迁”至 $\sigma_b = y$态的概率。

设e是电子束L中的单个电子，它在G_a中获得测量值 $\sigma_a = 1$ 的概率依赖于电子束L的性质，因此这个概率应写作$\Pr(\sigma_a = 1|\mathrm{L})$。在一定条件下，表达式中的符号L可以略去，这个概率就被略写作$\Pr(\sigma_a = 1)$。

用X表示事件“e在G_a中获得测量值 $\sigma_a = 1$”; Y表示事件“e在G_b中获得测量值 $\sigma_b = 1$”，则根据概率的乘法公式，在略去符号L的前提下，积事件X・Y表示事件“e在G_a中获得测量值 $\sigma_a = 1$ 并且在G_b中获得测量值 $\sigma_b = 1$”，其概率为

$$\Pr(\sigma_a = 1, \sigma_b = 1) = \Pr(\sigma_a = 1) \cdot \Pr(\sigma_b = 1|\sigma_a = 1)。$$

一般地说，对于 $x,y \in \{1, -1\}$，概率的乘法公式表成

$$\Pr(\sigma_a = x,\ \sigma_b = y) \equiv \Pr(\sigma_a = x) \cdot \Pr(\sigma_b = y|\sigma_a = x)。 \qquad (1)$$

这里的$\Pr(\sigma_a = x, \sigma_b = y)$ 就是我们要考察的联合概率，因为$\Pr(\sigma_a = x)$ 有一个隐蔽的初始条件L；这个联合概率也是如此。

在微观物理学中，联合概率$\Pr(\sigma_a = x, \sigma_b = y)$ 是没有定义的，我们可以把(1)式当作它的“操作定义”。

贝尔定理的中心点是贝尔不等式，而贝尔不等式是一个关于“自旋相关函数”的公式。下面，我们先给出该函数的定义，再为该函数给出一个人们在实践中反复应用，但却始终没有明确表述的“经典表达式”。

玻姆曾经提出如下的理想实验：一个电子源不断发射成对的电子，每对电子都处于“单态”，即总自旋为零的状态。设e和e’是其中的一对电子，e 向右飞遇到磁场方向为**a**的斯特恩 - 革拉赫装置，获得自旋（分量）的测量值σ_a，与此同时，e’向左飞遇到装置磁场方向为**b**的装置获得自旋的测量值τ_b。在这个实验中，σ_a和τ_b可以同时测量，因此，如果我们将这个实验重复N次，则对于给定的$x,y \in \{1,-1\}$，可以记录下其中的测量结果为$\sigma_a = x$, $\tau_b = y$的实验的次数N_{xy}。根据概率的频率定义，当N足够大时，同时测量σ_a和τ_b时获得测量结果为$\sigma_a = x$, $\tau_b = y$的概率为

$$\Pr(\sigma_a = x,\ \tau_b = y) = \frac{N_{xy}}{N}。$$

下面，我们规定$\sum_x$表示对$x \in \{1,-1\}$取和，$\sum_{xy}$表示对$x,y \in \{1,-1\}$取和，$\sum_{xyz}$表示对$x,y,z \in \{1,-1\}$取和。借助于上面的概率，可以定义σ_a和τ_b的乘积的平均值

$$P(\mathbf{a},\mathbf{b}) \equiv \sum_{xy} xy \Pr(\sigma_a = x,\ \tau_b = y), \tag{2}$$

$P(\mathbf{a},\mathbf{b})$就是e和e’的“自旋相关函数”。这个定义可以用测量的数据表成

$$P(\mathbf{a},\mathbf{b}) \equiv \frac{1}{N}\sum_{xy} xy\, N_{xy},$$

从而是“自旋相关函数”的原始定义。

实验证明：如果$\mathbf{b} = \mathbf{a}$，则$\tau_b = -\sigma_a$。这一结果可表成

$$\tau_b = -\sigma_b。 \tag{3}$$

应用经典概率论，从(3)式可以得出

$$\sum_{xy} xy \Pr(\sigma_a = x,\ \tau_b = y) = -\sum_{xy} xy \Pr(\sigma_a = x,\ \sigma_b = y)。 \tag{4}$$

(2)式与(4)式给出

引理 1：任意给定单位矢量 **a** 和 **b**，对于由(1)式给出的联合概率，有

$$P(\mathbf{a},\mathbf{b}) = -\sum_{xy} xy \Pr(\sigma_a = x,\ \sigma_b = y)。$$

这就是我们所说的自旋相关函数的“经典表达式”。为了重新考察贝尔定理，我们首先要弄清这个表达式是否适用于微观过程。

虽然$\Pr(\sigma_a = x,\ \sigma_b = y)$的取值与L有关，但根据引理 1，我们可以引进一个与L无关的函数

$$E(\mathbf{a},\mathbf{b}) \equiv \sum_{xy} xy \Pr(\sigma_a = x,\ \sigma_b = y)。 \tag{5}$$

它与自旋相关函数的关系是

$$P(\mathbf{a},\mathbf{b}) = -E(\mathbf{a},\mathbf{b})。 \tag{6}$$

3. 两个定理

贝尔曾经证明:“贝尔不等式与量子力学不相容”,这一命题的正确性是不容置疑的,问题在于从这一命题是否真的能得出贝尔定理,即是否真的能得出定域隐变量理论与量子力学不相容。在这里,我们将对贝尔不等式给出一种新的推导,从这一推导可以看出:在贝尔导出贝尔定理过程中,实际上用到了两个前提,一个是显露的,另一个是隐蔽的。显露的前提就是所谓“定域隐变量理论”,它的作用实际上可以由一个自旋相关函数的“经典表达式”来取代,而从这一前提也可以导出量子力学的自旋相关公式。由此可见,那个隐蔽的前提才是导致贝尔不等式的真正元凶。

实验证明

A:对于任意单位向量**a**和**b** 及其夹角 $\gamma = \angle(\mathbf{a},\mathbf{b})$,有:

$$\Pr(\sigma_b = 1|\sigma_a = 1) = \Pr(\sigma_b = -1|\sigma_a = -1) = \cos^2(\gamma/2);$$

$$\Pr(\sigma_b = 1|\sigma_a = -1) = \Pr(\sigma_b = -1|\sigma_a = 1) = \sin^2(\gamma/2)。$$

由于 $\sigma_a = 1$ 与 $\sigma_a = -1$ 是两个相互对立的事件,经典概率论给出:

$$\Pr(\sigma_a = 1|\mathrm{L}) + \Pr(\sigma_a = -1|\mathrm{L}) = 1,$$

它可以略写为

$$\Pr(\sigma_a = 1) + \Pr(\sigma_a = -1) = 1。 \qquad (7)$$

再把$\Pr(\sigma_a = x, \sigma_b = y)$略写成 $f(x, y)$,则根据(1)式、(7)式与命题A,容易证明:

$$f(1, 1) - f(-1, 1) - f(1, -1) + f(-1, -1) = \mathbf{a}\cdot\mathbf{b}。$$

另一方面,根据定义,我们有:

$$\sum_{xy} xy\, f(x, y) \equiv f(1, 1) - f(-1, 1) - f(1, -1) + f(-1, -1)。$$

上面诸式给出

引理 2:任意给定单位矢量 **a** 和 **b**,对于由(1)式定义的联合概率,有

$$\sum_{xy} xy \Pr(\sigma_a = x, \sigma_b = y) = \mathbf{a}\cdot\mathbf{b}。$$

引理 1 与引理 2 给出量子力学的自旋相关公式

$$\mathrm{P}(\mathbf{a}, \mathbf{b}) = -\mathbf{a}\cdot\mathbf{b}。$$

在上面的推导中,引理 2 是从命题 A、(1)式和(7)式导出的,命题 A 是一个实验事实,而(7)式不证自明,因此我们证明了

定理 1:从(1)式与引理 1 的合取,可以导出量子力学的自旋相关公式。

定理 1 表明(1)式与引理 1 的合取与量子力学相容。从而得出结论:(1)式与引理 1 都与量子力学相容,即:

第一,联合概率 $\Pr(\sigma_a = x, \sigma_b = y)$ 的操作定义与量子力学相容。

第二,自旋相关函数的经典表达式与量子力学相容。

另一方面,经典概率论又给出:

$$\Pr(\sigma_a = x, \sigma_b = y) = \sum_z \Pr(\sigma_a = x, \sigma_b = y, \sigma_c = z); \quad (8)$$

$$\Pr(\sigma_a = x, \sigma_c = z) = \sum_y \Pr(\sigma_a = x, \sigma_b = y, \sigma_c = z)。 \quad (8a)$$

$$\Pr(\sigma_b = y, \sigma_c = z) = \sum_x \Pr(\sigma_a = x, \sigma_b = y, \sigma_c = z); \quad (8b)$$

把 $\Pr(\sigma_a = x, \sigma_b = y, \sigma_c = z)$ 略写作 $F(x, y, z)$，考虑到概率不能取负值，则有：

B：任意给定单位矢量 $\mathbf{a}, \mathbf{b}, \mathbf{c}$ 和 $x, y, z \in \{1, -1\}$，存在函数 $F(x,y,z) \geqslant 0$，使得

$$\Pr(\sigma_a = x, \sigma_b = y) = \sum_z F(x, y, z);$$

$$\Pr(\sigma_a = x, \sigma_c = z) = \sum_y F(x, y, z);$$

$$\Pr(\sigma_b = y, \sigma_c = z) = \sum_x F(x, y, z)。$$

应用(5)式，可以从命题 B 得到

C：任意给定单位矢量 $\mathbf{a}, \mathbf{b}, \mathbf{c}$，存在函数 $F(x,y,z) \geqslant 0$，使得

$$E(\mathbf{a}, \mathbf{b}) = \sum_{xyz} xy F(x, y, z),$$

$$E(\mathbf{a}, \mathbf{c}) = \sum_{xyz} xz F(x, y, z),$$

$$E(\mathbf{b}, \mathbf{c}) = \sum_{xyz} yz F(x, y, z)。$$

从命题 C 容易导出不等式

$$|E(\mathbf{a}, \mathbf{b}) - E(\mathbf{a}, \mathbf{c})| \leqslant 1 - E(\mathbf{b}, \mathbf{c})。 \quad (9)$$

(6)式与(9)式给出贝尔不等式：

$$|P(\mathbf{a}, \mathbf{b}) - P(\mathbf{a}, \mathbf{c})| \leqslant 1 + P(\mathbf{b}, \mathbf{c})。$$

从而我们证明了

定理 2：从引理 1 和命题 B 可导出贝尔不等式。

考虑到引理 1 与量子力学相容，而贝尔不等式与量子力学不相容，从定理 2 可得出结论：命题 B 是贝尔不等式唯一的前提。于是我们得出结论：命题 B 与量子力学不相容。

4. 事件运算的布尔代数

如果说从(1)式与引理 1 导出量子力学的自旋相关公式，是经典概率论与量子力学殊途同归的一个例子；那么，命题 B 与量子力学不相容则是经典概率论与量子力学相矛盾的一个例子。第一个例子表明，经典概率论的某些运算规则适用于微观过程，而第二个例子则表明并非经典概率论的所有运算规则都适用于微观过程。有待解决的问题是：

在经典概率论中，哪些运算规则适用于微观过程，哪些运算规则不适用于微观过程。

我们已经看到，命题 B 是贝尔不等式唯一的前提，因此这一问题归结为弄清楚命题 B 有甚么毛病。

命题 B 可推导如下：

第一步，定义联合概率 $\Pr(\sigma_a = x, \sigma_b = y, \sigma_c = z)$。

第二步，从概率的频率定义得到(8)式：

$$\Pr(\sigma_a = x, \sigma_b = y) = \sum_z \Pr(\sigma_a = x, \sigma_b = y, \sigma_c = z)。$$

第三步，适当交换 $\sigma_a = x$， $\sigma_b = y$ 和 $\sigma_c = z$ 的次序，从(8)式得到：

$$\Pr(\sigma_a = x, \sigma_c = z) = \sum_y \Pr(\sigma_a = x, \sigma_c = z, \sigma_b = y);$$

$$\Pr(\sigma_b = y, \sigma_c = z) = \sum_x \Pr(\sigma_b = y, \sigma_c = z, \sigma_a = x)。$$

第四步，根据经典概率论的公式

$$\Pr(\sigma_a = x, \sigma_c = z, \sigma_b = y) = \Pr(\sigma_a = x, \sigma_b = y, \sigma_c = z);$$
$$\Pr(\sigma_b = y, \sigma_c = z, \sigma_a = x) = \Pr(\sigma_a = x, \sigma_b = y, \sigma_c = z), \qquad (10)$$

从第三步的两个等式得到(8a)式与(8b)式。

第五步，从(8)式、(8a)式与(8b)式，以及 $\Pr(\sigma_a = x, \sigma_b = y, \sigma_c = z) \geqslant 0$ 得到命题B。

下面，我们逐步地审查这些步骤。

比照(1)式，联合概率$\Pr(\sigma_a = x, \sigma_b = y, \sigma_c = z)$ 可以定义如下：

如果 $\sigma_a = x$、 $\sigma_c = z$ 和 $\sigma_b = y$ 是三个相继测量的结果，即一个有N个电子电子束通过一个磁场方向为**a**的斯特恩 - 革拉赫装置G_a时，有N_x个电子的自旋测量值为 $\sigma_a = x$，让这N_x个电子继续通过一个磁场方向为**c**的斯特恩 - 革拉赫装置G_c，设有N_{xz}个电子的自旋测量值为 $\sigma_c = z$，让这N_{xz}个电子继续通过一个磁场方向为**b**的斯特恩 - 革拉赫装置G_b，设有N_{xyz}个电子的自旋测量值为 $\sigma_b = y$，则当N足够大时，我们可以定义

$$\Pr(\sigma_c = z|\sigma_a = x) = N_{xz}/N_x; \qquad \Pr(\sigma_b = y|\sigma_c = z) = N_{xyz}/N_{xz};$$
$$\Pr(\sigma_a = x) = N_x/N; \qquad \Pr(\sigma_a = x, \sigma_b = y, \sigma_c = z) = N_{xyz}/N。$$

上面诸式给出如下操作定义：

$$\Pr(\sigma_a = x, \sigma_b = y, \sigma_c = z) \equiv \Pr(\sigma_a = x) \cdot \Pr(\sigma_c = z|\sigma_a = x) \cdot \Pr(\sigma_b = y|\sigma_c = z)。$$

由于(1)式给出的 $\Pr(\sigma_a = x, \sigma_b = y)$ 的操作定义与量子力学相容，上面给出的 $\Pr(\sigma_a = x, \sigma_b = y, \sigma_c = z)$ 的操作定义也不会与量子力学相矛盾。但是，对于这一操作定义，(8)式显然不成立。

现在考虑另一过程：还是考虑上面的三个斯特恩 - 革拉赫装置，其中G_a打开一个通道，通过它的诸电子获得自旋 $\sigma_a = 1$，G_b也打开一个通道，通过它诸电子获得自旋

$\sigma_b = 1$，G_c则同时打开两个通道。设有N个电子进入G_a，其中有N_1 个电子在G_c中获得$\sigma_c = 1$并逸出G_b，有N_2 个电子在G_c中获得$\sigma_c = -1$并逸出G_b。设e是进入G_a的N个电子之一，则按照概率的频率定义，当N足够大时，e在三个斯特恩 - 革拉赫装置中依次获得自旋$\sigma_a = 1$、 $\sigma_c = 1$、 $\sigma_b = 1$的概率为

$$\Pr(\sigma_a = 1, \sigma_b = 1, \sigma_c = 1) = N_1/N;$$

依次获得自旋$\sigma_a = 1$、 $\sigma_c = -1$、 $\sigma_b = 1$的概率为

$$\Pr(\sigma_a = 1, \sigma_b = 1, \sigma_c = -1) = N_2/N;$$

另一方面，实验证明，如果上面的实验中的其他条件不变，只去掉斯特恩 - 革拉赫装置G_c，让G_b直接连在G_a之后，则 e在G_a中获得自旋$\sigma_a = 1$，在G_b中获得自旋$\sigma_b = 1$的概率为

$$\Pr(\sigma_a = 1, \sigma_b = 1) = (N_1 + N_2)/N,$$

从而有

$$\Pr(\sigma_a = 1, \sigma_b = 1) = \sum_z \Pr(\sigma_a = 1, \sigma_b = 1, \sigma_c = z)。$$

一般地说，我们就得到(8)式。

诚然，在$\Pr(\sigma_a = x, \sigma_b = y, \sigma_c = z)$的操作定义中，$G_c$的两个通道是轮流打开的，而(8)式右边的同一概率表达式却要求G_c的两个通道同时打开，从而是不能测量的。尽管如此，它还是可以算作是$\Pr(\sigma_a = x, \sigma_b = y, \sigma_c = z)$的另一种定义。于是我们得出结论："可以定义联合概率$\Pr(\sigma_a = x, \sigma_b = y, \sigma_c = z)$，使得(8)式成立。"这样，推导命题C的第一步与第二步就同时通过了。

第三步也没有问题，(8)式是一个恒等式，在给定的交换之后确实仍然成立。

然而，第四步就大错而特错了！无论采用$\Pr(\sigma_a = x, \sigma_b = y, \sigma_c = z)$的操作定义还是(8)式所要求的定义，(10)式都肯定不成立。为什么呢？

经典概率论立足于两大基石：概率的频率定义与事件运算的布尔代数规则。概率的频率定义乃是概率这一概念所固有的，它被公认为对于微观过程仍然适用，但事件运算的布尔代数规则却并非如此。

对于经典概率论，事件乘法的交换律

$$A \cdot B = B \cdot A \tag{11}$$

成立。但(11)式也适用于微观世界吗？

让我们考察(1)式的如下特例

$$\Pr(\sigma_a = 1, \sigma_b = 1) \equiv \Pr(\sigma_a = 1) \cdot \Pr(\sigma_b = 1 | \sigma_a = 1)。 \tag{12}$$

适当改变其中的符号可以得到

$$\Pr(\sigma_b = 1, \sigma_a = 1) \equiv \Pr(\sigma_b = 1) \cdot \Pr(\sigma_a = 1 | \sigma_b = 1)。 \tag{13}$$

用A表示$\sigma_a = 1$，B表示$\sigma_b = 1$，则事件运算规则$A \cdot B = B \cdot A$给出概率公式

$$\Pr(\sigma_b = 1,\ \sigma_a = 1) = \Pr(\sigma_a = 1,\ \sigma_b = 1)。 \quad (14)$$

但是，根据(1)式的操作定义，(12)式与(13)式表示迥然不同的过程，因此(14)式显然不成立，在这种意义下，(11)式不成立。

对于经典概率论，“积事件”A・B 表示“A 事件与 B 事件都发生”，而 B・A 表示“B 事件与 A 事件都发生”，这两个命题等价。但是，如果定义“积事件”A・B 表示“A 事件先发生而 B 事件后发生”，则 B・A 表示“B 事件先发生而 A 事件后发生”，这两个命题就不再等价。我们满可以保留概率的频率定义而适当修改经典概率论的事件运算的规则来建立某种“非布尔的”概率论，而把量子力学的概率运算规则看作其中的一种。

诚然，这是一个离题太远的数学问题，我们只需记住如下要点就够了：在微观世界可以定义(1)式那样的联合概率，并且允许各种概率运算，但不能任意应用布尔代数的事件运算规则。特别是，(11)式不成立。同样，公式

$$(A \cdot B) \cdot C = (A \cdot C) \cdot B。$$

也不成立。导出(10)式时，刚好用到(11)式和上式。因此，(10)式肯定不成立。

既然导出命题 B 的第四步曾用过(10)式，命题 B 的整个推导就是非法的，而贝尔不等式又来自命题 B，可见贝尔不等式的推导也是非法的。这样，我们就不必惊讶贝尔不等式与量子力学相矛盾，也不必惊讶它与实验结果不符了。

一般地说，对于微观过程，事件运算不遵循布尔代数的规则，换句话说，微观事件的事件空间是“非布尔的”。贝尔不等式的推导之所以非法，就是因为对“非布尔的”微观事件空间应用了布尔代数的规则。

5. 一个未证明的命题

由于量子力学的自旋相关公式与贝尔不等式都以引理 1 为前提，对于上世纪 70 年代的那些检验贝尔不等式的实验来说，这个引理不是被检验的对象。另一方面，证明这个引理的关键的前提是(4)式，而(4)式又容易被人认为是不证自明的：人们认为，根据实验事实 $\tau_b = -\sigma_b$，我们可以在 $\Pr(\sigma_a = x, \tau_b = y)$ 中把 $\tau_b = y$ 换成 $\sigma_b = -y$，从而得到

$$\Pr(\sigma_a = x,\ \tau_b = y) = \Pr(\sigma_a = x,\ \sigma_b = -y), \quad (15)$$

于是立刻得到(4)式。

但实际上问题不那么简单，(15)式的两边表示不同的过程：左边涉及两个电子；右边则只涉及一个电子。左边涉及同时发生的两个事件，其物理意义不容置疑；右边则涉及先后发生的两个事件，我们仅能给出其操作定义。更糟糕的是：右边有一个隐蔽的初始条件而左边却没有。对于这样含义迥然不同的两个概率表达式，像上面那样的“替换”运算是相当可疑的。

可以证明，(15)式并不成立而(4)式却确实成立。在这里，我先不给出这一证明。原因有二：第一，这一证明极为冗长而又曲折，远不是引人入胜的，我担心读者没有耐心读它；第二，由于我对贝尔定理的看法冒犯权威，难免受到谴责。但是，如果有一天我的看法得到了公认，我又免不了从另一方面受到谴责，人们会说我的看法“没有任何新内容，它的全部公式与命题都只不过把别人的东西拿来改头换面而已。”明察秋毫的批评家们将揭露：文中有某一句话与张三说过的话雷同（至于这句话与我的证明有没有关系，倒是不必深究的），或者，文中有三两句话与李四说过的话意思相近，等等。由此就无情地得出结论：除了剽窃和故弄玄虚以外，我的看法一无是处。与其到那时我走投无路，倒不如今天留一个心眼，把这个关键的证明先装在口袋里，到时候我虽然铁定是剽窃者，但至少还拥有对于这个证明的优先权。

6. 结束语

我们已经看到，贝尔不等式起源于事件运算的布尔代数规则，它既与定域性原理无关，也与隐变量理论无关。因此，上世纪 70 年代的那些检验贝尔不等式的实验，只不过再一次确认“微观过程的事件空间是非布尔的”，这一工作似乎很难说是一个“物理学中最重要的进展”，更难说是一个“科学中最深刻的发现”。

Bell’s Inequality and Boolean algebra

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Abstract: As it is known that classical probability theory is unnecessary for quantum mechanics, but another problem remains to be solved: how goes it if applying classical probability to micro processes. It is sure to obtain some conclusion in conflict with quantum mechanics; or quite the reverse, from classical probability we will reach the same goal herein as quantum mechanics? Up to now, this problem has never been examined, and thereby the field it concerning forms a blind area in micro physics. When the question involves the relation between classical physics and quantum physics, it is hard to avoid going astray in this blind area. Bell’s theorem is just a typical example herein.

Despite for Bell’s theorem the proofs are varied, the same essential character remains. All of these proofs the laws of classical probability theory, specially, the laws of unite probabilities, has used. The question whether these laws suitable for the process that Bell consider exactly falls on the above blind area. Herein quantum physicists obey consciously the following norm: They tacitly approve that all these laws are unsuitable for micro processes when starting from

quantum mechanics, and acquiesce those are suitable when starting from local hidden variable theory. Bell's theorem is just a product of such an absurd norm.

In the proof of Bell's inequality, the theses, which characterize, as generally believed, local hidden variable theory, can be summed up as a classical expression of the spin correlation function. But this expression never leads to Bell's inequality for the following reasons: Firstly, from it we can derive the spin correlation function expression in quantum mechanics. Secondly, in the course to derive Bell's inequality, a proposition originating from Boolean algebra rules in classical probability theory is used unawarely. From the above two reasons it is concluded that Bell's inequality originates from the step applying Boolean algebra rules on the non-Boolean micro event space, and it is related neither to locality nor to hidden variables. [Academia Arena, 2009;1(3):32-42]. ISSN 1553-992X.

Key words: Bell's inequality; locality principle; hidden variable theory; spin correlation formula; classical probabilistic theory; probability operations; event operations; Boolean algebra; quantum mechanics

Fault effect at Volumetric modeling in shadegan oilfield using RMS software

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Abstract

The Shadgan petroleum oil field located in Dezful Embayment is a symmetrical anticline with 23.5Km length and 6.5Km width in the Asmari top horizon. The field trend is similar the regional Zagros trend.The aim of the present study is to fault 3D-modeling and distribution of fluids of the Asmari reservoir using RMS software. The computer program utilizes of advanced mathematical and geostatical function to provide 3D insight of different reservoir properties such as structure and geology, dynamic and volumetric fluids. Structural modeling is the first stage in modeling procces . these stage design reservoir geometry with fault and zones. To calculate in situ oil volume, fluid and reservoir data are input data to software. This model constructed by help of critical limit concerned porosity, water saturation and shale ratio. Generally, with adjustment of fault and volumes models apparent , faults effect to the petrophysical properties quality and rate of replacement fluids of reservoir. Generally, evaluation of the reservoir, fault effects and oil volume determination are the main out put results of RMS software. [Academia Arena, 2009;1(3):43]. ISSN 1553-992X.

Keywords: effect; Volumetric modeling; RMS software

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Evaluation of Sea water Intrusion in Freshwater Aquifers in a Lagoon Coast: A Case Study of the University of Lagos Lagoon, Akoka, Nigeria.

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ABSTRACT: A geophysical technique has been employed to investigate seawater intrusion into freshwater aquifers in the coastal environment of the Lagos lagoon at the University of Lagos campus, Akoka, south western Nigeria. Electrical resistivity method employing the Schlumberger array was used to acquire data for six vertical electrical soundings to investigate the vertical extent of seawater intrusion. The study revealed that the subsurface in contact with the lagoon was invaded by saline oceanic seawater. The Schlumberger electrode array which utilized current electrode half spacing from 1m to 500m was used to acquire both resistivity and induced polarization data in the proximity of the Lagos lagoon. Typical curve types reported for coastal areas such as the KQ, KQQ, and HKQ were observed in the investigated area and 4-6 geoelectric layers were delineated at an average depth of 71m. The subsurface lithology comprised of fine through medium grained sand to coarse sand intercalated in most cases with sandy clay and clayey sand. The resistivity of the intruded saline water was found to range between 1.8-37.2Ωm at a depth interval of 0.7-79m and the thickness of saline layers was found to be greater in the proximity of the coastline. The result of the investigation revealed that even under non-pumping conditions, the study area suffers from acute saline water intrusion and could be aggravated if there is groundwater abstraction. Ways to check the seawater intrusion problem through artificial recharge have been proposed in the study. [Academia Arena, 2009;1(2):44-54]. ISSN 1553-992X

INTRODUCTION

Over time, there has been heavy reliance on groundwater resources to supplement surface freshwater supplies for use in domestic, industrial and agricultural requirements. Most times, however, groundwater resources are preferable to surface water resources on the basis of easier protection from pollution and better dependability during drought periods. It has also been found that groundwater supplies are more economic in purification aspects than alternative water supplies, specifically surface water resources.

Coastal sedimentary basins the world over have been inundated by saline oceanic seawater intrusion which leads to the invasion of wells drilled to the subsurface to yield freshwater by saline water, and Nigeria has not been an exception. Saltwater intrusion in coastal aquifers in Nigeria have been a source of public grievance as several wells drilled to the groundwater table were abandoned only a few months after due to saline water intrusion. Even in some areas, freshwater supplies from groundwater sources have been impossible due to saline water dominating aquifers. Saltwater intrusion is a natural process that occurs in virtually all coastal aquifers, it is not only a national phenomenon, but a global crisis.

In characterizing the extent of this occurrence, attempted studies have been directed particularly to coastal areas in contact with seas, but rather few studies have been conducted to evaluate the possibility of the occurrence via a lagoon. Even most studies in this regard attribute the seawater

as being relict and neglect the obvious impact of the saline water bodies. With a maritime area of about 46,500km^2 and a coastline of 853km parallel to the Atlantic ocean, Lagos, is essentially a maritime state backed up by numerous rivers, lakes, creeks, swamps and lagoons; in an attempt to evaluate the possibility of seawater intrusion to the subsurface via the lagoon, this study was conducted.

The investigation of seawater intrusion in freshwater aquifers has been based on geophysical techniques especially the electrical resistivity and electromagnetic methods which relies on resistivity contrasts as the seawater intruded zone is approached, (Goldman *et al.,* 1989; Fitterman and Deszcz-Pan, 2001; Kontar and Ozorovich, 2006; Khalil, 2006; Al-sayed and El-Qady, 2007); their studies were carried out in the proximity of seas. The presence of seawater causes groundwater to be considerably saline, hence the aquifer resistivity is reduced considerably, and the resistivity method can delineate the boundaries of the body of saline water. The fact that a resistivity contrast exists at the interface between fresh and saline water is sharp, the resistivity method has proved useful.

A geochemical study can also be used to determine the possibility of seawater intrusion and this has been used by Lee and Song, 2007. However, for enhanced results, a combination of geophysical and geochemical analysis have proved useful, (Hwang *et al.,* 2004).

Oyedele (2001) combined a geophysical and geochemical analyses to show the presence of seawater intrusion in Victoria Island and Iwaya in Lagos state, south western Nigeria. He suggested that the freshwater/saltwater interface (FWSWI) is relatively shallow and water withdrawals are from depths close to the FWSWI. And he contends that excessive groundwater withdrawals can increase the incidence of seawater intrusion.

Adepelumi *et al.* (2008) in an attempt to demarcate possible areas for groundwater development in the Lekki area of Lagos state, obtained resistivity results which revealed a dominant trend of decreasing resistivity with depth, indicating an increase in salinity with depth. They however traced the presence of the salinity to excessive groundwater pumping and the reduction of groundwater gradients. They established the inherent presence of saline water in the subsurface of their area of investigation as being trapped during the transgressive, and the regressive movement of the ancient sea during the quaternary times when some sediments were contemporaneously deposited under marine condition. They inferred that the saline water found at a shallow depth (10-30m) was probably trapped during marine transgression and/or it migrated from depth by differential pressure-gradient. One can infer the source of saline water in the subsurface as connate according to the referenced report. They, however, did not particularly cite the influence of the lagoon which surrounded their study area. Their analysis is based on Kingston *et al* (1983) who suggested that prior to the fluctuation of the sea level in Lagos area, series of miogeoclinal depressions were formed at the edge of the rifting Atlantic Ocean. These depression zones were later filled with seawater where the sediments were deposited. It can be inferred that the saltwater was trapped during the period of marine deposition. The possibility of seawater intrusion by the tidal movement of saline seawater presently was not examined. And this study attempts to bridge that gap.

The Lagos lagoon coast bordering the University of Lagos to the east on the lagoon front overlooking the university guest houses, senate building, University library, human resources development board offices and the faculty of engineering are the focus of the study. It lies on latitude $6^{o}30{\cdot}40^{'}$N and $3^{o}24{\cdot}52^{'}$E longitude. It lies on marshland of vast mangrove and freshwater swamps, surrounding a small and much dissected table land consisting of freshwater swamp forest, mangrove swamp forest, sandy plain vegetation and rainforest vegetation (Ayolabi, 2004).

The Lagos lagoon borders the university campus to the east and south. Bariga borders it to the north while Yaba lies towards the west. A canal runs along almost the whole of the western stretch of the university, while a marsh which has an open connection to the lagoon encompasses the whole of the northern stretch of the University, linking up with the canal in the west.

HYGROGEOLOGIC SETTING OF THE STUDY AREA

The study area is situated in Lagos State (figure 1) which is found within the Benin basin. The geology has no basement outcrop. It lies on the longitude 3^0E and latitude 7^0N with alternate wet and dry seasons. The Benin basin extends almost from Accra in Ghana, through the Republics of Togo and Benin to Nigeria where it separated from the Niger- Delta basin by Okitipupa ridge (Ondo state) at the hinge of the Benin flank. The bottom of the sedimentary basin in the Benin basin consists of unfossilferous sandstones and gravels weathered from the underlying Precambrian basement. On top of these are marine shales, sandstones and limestones of Albian to santonian ages.

The area of investigation is low-lying with some depressions observed which are prone to flooding, as they are apparently below the surface of the lagoon.

The surface geology is made up of the Benin formation (Miocene to Recent) and the recent littoral alluvial deposits. The Benin formation consists of thick bodies of yellowish (ferruginous) and white sands (Jones and Hockey, 1964). It is friable, poorly sorted with intercalation of shale, clay lenses and sandy clay with lignite. The formation is overlain in many places by considerable thickness of red earth composed of iron-stained regolith formed by weathering and ferruginization of the rode (Onyeagocha, 1980). Multi-layer aquifers have been classified by Longe *et al.* (1987) into three types-the first encountered at a depth of 38m of average thickness of 8m and is not a major source of water supply and stands the risk of pollution because of its nearness to the surface. The aquifer probably belongs to the recent littoral/alluvial depth of 30m to 120m below sea level near the coast, it consists of an alternating sequence of sands and clay. The aquifer probably belongs to the continental Ilaro formation which is described as a sequence of predominantly coarse sandy estuarine deltaic and continental beds. The third aquifer is made up of alternating sequences in shape. This aquifer is the most productive and exploited region. It occurs between depths of 30-100m below sea level in inland areas and 120-270m near the coast. The thickness varies between 10 and 35m. The aquifer most likely forms part of the Ilaro formation.

In the Benin basin, salt water intrusion into recent sediments aquifers occurs beneath a freshwater lens in a belt stretching from the coastline to a distance of 5km in some places. Saltwater intrusion has also been found to occur in the confined aquifers of the coastal plain sands in a zone stretching from Apapa to Lekki within Lagos metropolis (Oteri and Atolagbe, 2003).

Lagoons are common features on the Guinea coast of West Africa. The Lagos lagoon with a surface area of 6354.798km^2 is open, tidal and brackish, and is the largest of the eight lagoons in southwestern Nigeria. The Lagos lagoon, a water body in the heart of the metropolis, cuts across the southern part of the metropolis, linking the Atlantic Ocean (in the west and south) and the Lekki lagoon (in the east). The Lagos lagoon consists of three main segments, Lagos harbour, the metropolitan and Epe division segment.

The bottom water of the lagoon has high temperatures which were relatively constant throughout the year. The temperatures varied between 32.7^{o}C in December 2002 at the entrance of the Ogun river near Ikorodu and 27^{o}C in 2003. During the rains (April to November) the influx of river water and heavy cloud cover in the sky resulted in a gradual fall of the temperatures to a minimum of 26^{o}C.

There is differential salinity in the lagoon due to the effect of the Atlantic Ocean. The bottom deposits ranged from coarse shelly sand around the mouth of Lagos harbour through various grades of muddy sand to mud. Sandy mud or muddy deposits occurred in the central areas with muddy sand or sand being attributed to the fast water currents in the area. The seabed in the metropolitan areas is relatively higher and increases towards the Epe segment of the lagoon. The seabed has been distorted by semi and large scale mining especially towards the Ikorodu area of the lagoon.

All the water bodies dominating Lagos State, the Lagos lagoon inclusive, others have a common connection to the Atlantic Ocean via the commodore channel (see figure 1). Thus some of the hydrologic conditions prevailing in the Gulf of Guinea are reflected to some extent in the Lagos lagoon, going by the definition put forward earlier.

The entire Gulf of Guinea is highly stratified with a thin surface layer of fresh tropical water overlying high salinity subtropical water (because of density difference). An additional contribution of saline water comes from subducted subtropical water from the Atlantic Ocean. This saline water communicates with the Lagos lagoon via the Commodore channel largely dependent on the direction of the tides.

DATA ACQUSITION AND PROCESSING

In this work, a total of six VES points were occupied along selected traverses namely AA', BB' and CC'. The traverses AA' and CC' were taken parallel to the shoreline of the lagoon stretching westward, while the traverse BB' was taken perpendicular to the shoreline. The Schlumberger electrode array was utilized for the data acquisition which was done with the ABEM terrameter SAS 1000. The current electrode half spacing for the survey ranged from 1 to 500m in successive steps.

The field data were curve matched using the conventional curve matching technique and the layer parameters obtained were used as an input model for a fast computer iteration and modelling software known as RESIST©. The application of this software is a standard procedure for obtaining a fairly accurate estimate of the subsurface resistivity distribution.

The addition of Induced Polarization (IP) data to a resistivity investigation improves the analysis of resistivity data in three ways: (1).Some of the ambiguities encountered in resolving thin stratigraphic layers while modeling electrical resistivity data can be reduced by the analysis of IP data, (2).IP data can be used to distinguish geologic layers which do not respond well to an electrical resistivity survey; and (3).The measurement of another physical parameter (electrical chargeability) can be used to enhance a hydrogeologic interpretation such as discriminating equally electrically conductive targets such as saline, electrolytic or metallic-ion contaminant plumes from clay layers.

The interpreted data were contoured in order to observe the resistivity, thickness, and depth of saline layers and the freshwater/saltwater interface (FWSWI). The SURFER© 8 software was used in producing the maps.

DISCUSSION OF RESULTS

The analysis of resistivity data revealed the presence of four to five geoelectric layers along profiles AA' and BB' while six geoelectric layers characterized profile CC'. Typical curve types characteristic of saline water intruded zones were observed such as AKQ, KQH, KQ and KQQ. The curves were found to descend gently indicating a conductivity decrease which can be explained in terms of the seawater intrusion into subsurface formations. The descending segment of the VES curves are characterized by a steeply low resistivity zone (figure 2). The IP curves wre interpreted thus: the electrode-depth ratio was used to estimate the depths at various electrode spacings. Chargeabilities of <50msec were interpreted as sand, while those >50msec or negative were interpreted as clay; fluctuations in the IP profile was not unconnected with the clay and sand mixture. These were interpreted as sandy clay or clayey sand depending on the degree of fluctuation.

The correlation of the resistivity, IP (figure 3) and available borehole log in the study area revealed that the topsoil along traverse A-A' is made up of fine to medium sand with characteristically low resistivity attributed to the overflow of saline oceanic seawater via the lagoon. The resistivity ranges between 11.5Ωm to 43.7Ωm with a thickness ranging from 0.7m to 1.7m. This layer is underlain by a medium sand bed which is the second geoelectric layer of resistivity 3.4Ωm to 74.9Ωm, and thickness of 2.2m to 9.9m. The third geoelectric layer beneath this traverse is a continuous sandy clay formation which grades into the fourth geoelectric layer beneath VES 1, 2, 3 and 4; and into the fifth geoelectric layer beneath VES 2. These layers are considered to suffer from acute seawater ingress, with formation resistivity of 7Ωm to 42.10Ωm. The thickness of this layer ranges from 12m to 70m. (See figure 4). The fifth layer beneath VES 4 is a high resistivity coarse sand or clayey sand formation.

The geoelectric section along traverse B-B' consists of VES 5. The topsoil is the first geoelectric layer with formation resistivitiy>100Ωm and is made up of coarse sand. The second geoelectric layer, even though it is a relatively good freshwater aquifer; apart from its proximity to the surface and consequently, exposure to pollution, it's thickness of 0.9m does not favour exploitation. The third geoelectric layer can be considered as the zone of rapidly mixing fresh and saline water. With a formation resistivity of 64.1Ωm and thickness of 5.8m, it is comprised of medium sand/ sandy clay. The fourth geoelectric layer suffers from acute saline water intrusion due to the presence of seawater. With a resistivity of 1.8Ωm and thickness of 12.8m, it is composed of sandy clay. It is underlain by a coarse sand/clayey sand freshwater aquifer zone of unknown thickness and resistivity of 210.7Ωm.

The geoelectric section along traverse C-C' consists of VES 6. The topsoil is sand formation with a resistivity of 47.9Ωm and 0.8m thick. The second and third geoelectric layers which are coarse sand beds are freshwater bearing aquifers saturated by very good quality freshwater. The formation resistivities are 260.7Ωm and 309.9Ωm, and 1.2m and 6m thick respectively. The fourth geoelectric layer is composed clayey sand, saturated with good quality water. The resistivity of this layer is 89.7Ωm and it is 29.9m thick. The fifth geoelectric layer has a resistivity of 8Ωm, and 34m thick. The lithology which is composed of saline-water saturated clayey formation is

underlain by coarse sand bed which bears very good quality water. This layer has a resistivity of 532.5Ωm.

The interpreted data were subjected to processing using the SURFER 8 Golden software to produce the various contour maps. These show the lateral and horizontal extent of saline oceanic seawater intrusion. The study area shows evidence of subsurface formations by saline water intrusion. The depth of penetration of saline water intrusion increased from the lagoon coastline inwards.

Maps of isoresistivity surfaces for estimating depth to saline and freshwater zones at the locations occupied are shown in the figures below (figure 5a-f). The observed trend is that the thickness of the saline water formation is increasing towards the coast. In addition, the depth to the saline water zone is found to be relatively shallow near the coast compared to inland areas. The depth to the FWSWI varies from about 72m near the coast to about 20m in inland areas. The resistivity of the freshwater aquifer is found to decrease as distance from the coast increases.

The isoresistivity contour map for saline water surfaces indicates that the resistivity of saline water tends to decrease towards the coast. Higher resistivity values are observed further away from the coast, i.e. at Tafawa Balewa way. It is expected however that this resistivity grades gradually through intermediate water to good quality water as distance from the coast keeps increasing. And the isoresistivity map for freshwater shows that reasonably good aquifers containing very good quality water can be found far away from the coastline. This is attributable to the high resistivity values which are observed as the distance from the coastline increases.

The depth to saline water surfaces is shallower in the proximity of the lagoon. With an increase in the distance from the coastline, the depth to saline water surfaces increases to about > 22m. the traverse taken at Tafawa Balewa way was at a higher elevation than the lagoon water from those occupied at the Lagoon Front and Oduduwa Drive in which the water and ground level were approximately the same. The explanation then was that the salts are transported when there is overflow, moved further by wind action, settle gravitationally and are pushed down the subsurface by meteoric water. In the case of Tafawa Balewa way, the saline water hits the wall of the adjoining ground carrying some sediments, salts inclusive. Further lagoon water hitting the walls transports the salts further until they meet an impermeable layer which traps the salts.

The thicknesses of saline water zones are greater in the proximity of the lagoon. Less thick beds are found away from the lagoon. The thickness of saline water intrusion is lowest at Oduduwa Drive because it is dominated by freshwater aquifers and the most we can find is intermediate water of rapidly mixing fresh and saline water.

The salinity problem may exist due to upward movement of water and salts from groundwater. For coastal aquifers, the influence of seas, oceans, and lagoons are predominant. Since it is a saline problem, the validity of including lagoons in the picture have been emphasized. The salt enrichment process of the subsurface is spread over to thousands of millions years, during which the determining parameters of rainfall, hydrology and other climatic factors have not remained constant. Much as we do not want to envisage relict seawater, whether or not it occurs, or the salinity can be attributed to saline surface water intrusion shall become apparent at the end of this treatise.

One of the potential causes of subsurface salinity which does not require too geologically long a time, has been reported by Achari *et al.* (2005) was the inundation of an entire barrier by the surface influx of seawater where the tsunami impact on groundwater quality was assessed. They proferred an explanation for the process that led to groundwater salinization thus: when seawater ingressed over the surface, by waves with heights ranging from 4 to 7m, it carried along some dissolved salts, which were lodged in the soil. The salts brought by the mighty waves sink into the soil and with the first rains of the year, the absorbed salts leach down to the groundwater aquifer and contaminated it. When the dry summer months advance, evaporation causes the salt to accumulate in the subsurface, pending recharge (by the sea, which brings in more salts anyway). Rainfall recharge pushes the saltwater, further down in an attempt to establish hydrodynamic equilibrium capillary rise in rainless months push the salts up. In all, the soil salinity is significant for a considerably long time and is a continuous process.

Summary of Interpretation

VES No	Geoelectric Layers	Resistivity (Ωm)	Thickness (m)	Depth (m)	Curve Type	Probable Lithology	Inferred Interpretation
1	1	37.50	1.2	1.2	KQ	Fine to medium sand	Topsoil
	2	58.30	9.9	11.1		Medium sand	Intermediate quality water
	3	33.33	101.0	112.2		Sandy clay	Saline water
	4	9.00	-	-		Sandy clay	Saline water
2	1	41.50	1.7	1.7	KQQ	Fine to medium sand	Topsoil
	2	74.90	6.5	8.2		Medium sand	Intermediate quality water
	3	37.20	12.5	20.8		Sandy clay	Saline water
	4	34.50	58.4	79.2		Sandy clay	Saline water
	5	7.60	-	-		Sandy clay	Saline water
3	1	43.7	1.6	1.6	KQ	Fine to medium sand	Topsoil
	2	56.9	9.1	10.7		Medium sand	Intermediate quality water
	3	42.1	59.2	69.9		Sandy clay	Saline water
	4	12.70	-	-		Sandy clay	Saline water
4	1	11.5	0.7	0.7	HKH	Fine to medium sand	Topsoil
	2	3.6	2.2	2.8		Sandy clay	Saline water
	3	61.6	16.6	18.8		Medium sand/Sandy clay	Intermediate quality water
	4	7.0	52.4	71.2		Sandy clay	Saline water
	5	514.1	-	-		Coarse sand/ Clayey sand	Very good quality water
5	1	101.00	0.7	0.7	KQH	Coarse sand	Topsoil
	2	131.60	0.9	1.6		Coarse sand	Very good quality water
	3	64.1	5.8	7.4		Sandy clay	Intermediate quality water
	4	1.8	12.8	20.2		Sandy clay	Seawater/ very saline water
	5	210.7	-	-		Coarse sand/ Clayey sand	Very good quality water

6	1	47.9	0.8	0.8	AKQH $\rho_1 < \rho_2 < \rho_3 > \rho_4 > \rho_5 < \rho_6$	Fine to medium sand	Topsoil
	2	260.7	1.2	2.0		Coarse sand/ Clayey sand	Very good quality water
	3	309.9	6.0	8.0		Coarse sand/ Clayey sand	Very good quality water
	4	89.7	29.9	37.9		Clayey sand	Good quality water
	5	8.0	34.0	71.9		Clay	Saline water
	6	532.5	-	-		Coarse sand/ Clayey sand	Very good quality water

Figure 1: Geological map of Nigeria showing the location of the study area. Inset is the image of Lagos state showing the distribution of lagoon water up to the study area.

a.Iterated curve for VES 1 b Iterated curve for VES 2 c. Iterated curve for VES 3

d.Iterated curve for VES 4 e.Iterated curve for VES 5 f.Iterated curve for VES 6

Figure 2a-f: Computer iterated curves.

a.IP curve for VES 1 b.IP curve for VES 2

c.IP curve for VES 3 d.IP curve for VES 4

e.IP curve for VES 5 f.IP curve for VES 6

Figure 3a-f: Induced Polarization curves

Figure 4: Subsurface conceptualisation of the study area inferred from the VES and IP interpretation correlated with the available borehole log.

a.Isoresistivity map for saline water horizon (2-46Ωm). Contour interval is 2Ωm.

b.Isoresistivity map of freshwater aquifer. Average depth is 28m. Average depth is 21m. Contour interval is 80Ωm.

c.Depth to saline water isoresistivity surface. Contour interval is 20m.

d. Depth to freshwater aquifers. Contour interval is 8m.

e.Isopach map of saline beds. Contour interval is 10m.

f. Contour map of depth to freshwater/saltwater interface

Average depth is 54m. Contour interval is 15m.

Figure 5a-f: Isoresistivity, isopach and depth maps of the study area.

CONCLUSION

In evaluating seawater intrusion into coastal aquifers of lagoonal environments, six vertical electrical sounding measurements were conducted at selected stations at the University of Lagos, Akoka; to acquire both resistivity and IP data. From the one dimensional interpretation of the acquired data, it was found that saline water intrusion which is characteristic of seawater penetrated the subsurface in contact with the lagoon. The depth of the intrusion increased as distance from the coastline increased. In addition, typical curve types which are characteristic of coastal Nigeria sedimentary basin such as the KQ, KQQ, KQH, HKQ and AKQH were observed in the study area.

The astonishing rapidity with which saline water inundates the subsurface has been elucidated and elaborated. The study shows that the area suffers from acute saline water intrusion. It also attempted to look at the origin of the salts as being due to the deposition of sediments during flow towards land areas and the influence of meteoric water which serves to push some of these sediments down the subsurface. The study however, is not a radical departure from the view that saline water found its way into the aquifers due to an upwelling of saline water, whose origin is connate.

Seawater intrusion is a natural phenomenon in coastal aquifers. Whether we like it or not, it occurs. Ways in which this happens have been examined. However, it becomes problematic when man withdraws water close to coastal areas. So in attempting to minimize the problem, monitoring its expansion and retreat, a geophysical approach has been proposed.

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Potential Beneficial Effect Of Functional Food Components In Alzheimer' Disease

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ABSTRACT: Elevated oxidative stress, inflammation and reduced acetylcholine have been reported in Alzheimer' disease. The present study has been postulated in a trial to find out functional food components that may reduce the deterioration or retard the onset of the disease through ameliorating the aforementioned criteria. The tested fractions were methanol and petroleum ether extracts of Carica fruit, leaves and seed, Origanum herb, ginger, grape leaves and fruit (raisin), and fig fruit. Antioxidant effect and cholinesterase inhibiting activity have been tested in-vitro. Anti-inflammatory effect was evaluated in carragenan model in rats. Total phenolic contents of the different tested plants were determined. G.C. analysis of unsaponifiable matter of the ginger lipid fraction was carried out. Results showed that the highest antioxidant activity belonged to methanol extract of ginger (88%), Carica leaves (85%) and Origanum (74%) while the most potent anti-inflammatory effect was attributed to methanol extract of Carica fruit followed by the methanol extract of grape leaves then methanol extract of fig. Petroleum ether extract of ginger showed the highest cholinesterase inhibiting activity (85%) followed by petroleum ether extract of Carica seeds (73%) then methanol extract of raisin (66%), petroleum ether extract of Carica leaf (65%) and petroleum ether extract of fig (63%). Results of total phenolic showed grape leaves to contain the highest content (93.52 mg gallic acid equivalent/g dry sample) followed by Origanum (77.93), Carica leaves (41.1), Carica fruit (30.29), ginger (29.29), Carica seed (26.70), and raisin (23.75). Figs showed the least phenolic content (14.27). G.C. analysis of unsaponifiable lipid fraction of ginger showed total identified phytosterol to be 0.738% and total hydrocarbon to be 86.242% of total unsaponifiable matter. **Conclusion:** The highest antioxidant and cholinesterase inhibiting activity were attributed to methanol and petroleum ether extract of ginger respectively. While methanol extract of Carica fruit was superior as anti-inflammatory agent. Combination of the previously mentioned extracts may have potential beneficial effect towards Alzheimer disease. . [Academia Arena, 2009;1(2):55-68]. ISSN 1553-992X

Keywords: Beneficial Effect; Functional Food Components; Alzheimer' Disease

INTRODUCTION

Alzheimer' disease (AD) is a neuropsychiatric condition with progressive neurodegeneration, dementia and decline of cognitive function, usually accompanied by behavioral disturbances [1]. AD is the fourth cause of death in Europe and U.S.A. [2]. It appears as a new epidemic threatening of human civilization in the next century. Its incidence, at present, doubles every five years. AD affects almost 4 million Americans (1.5% of the population) and costs $ 65 billion annually [3]**.** In Egypt, no actual survey showed the prevalence rate of Alzheimer; however a study in Assiut governorate showed 2.2% of populations over the age of 60 have Alzheimer [4]**.**

Previous studies demonstrated elevated oxidative stress in brains and peripheral tissues in AD patients, as well as in animal models of AD [5, 6]**.** AD is characterized by senile plaques, fibrillary tangles and a reduction of cholinergic neurons in brain. The major component of senile plaques was amyloid beta peptide (Aβ), a 39 – 43 amino acid peptide. Aβ was shown to have the potential to induce oxidative stress and inflammation in the brain, which were postulated to play important roles in the pathogenesis of AD [7]**.** Aβ induces the production of hydrogen peroxide and lipid peroxide in neurons [8]**.** In addition, Aβ has been reported to induce superoxide [9] and pro-inflammatory cytokines such as interleukin-1β (IL-1β) [10] in brain. Increased IL-1β in brain may contribute to memory deficit [11]**.** There is a strong evidence for the presence of a localized inflammatory reaction in AD brains that may be involved in neurodegeneration in

AD [12]. Levels of tumor necrosis factor, an inflammatory marker, were elevated in CSF and serum [13]. During the past two decades, a wide range of inflammatory markers, typically absent in the normal elderly population have been reported in AD brains [12] and accumulating evidence suggested that sustained brain inflammation might be an essential cofactor in AD pathogenesis [14]. On the other hand, there is evidence suggesting that oxidative stress contributes to the formation of amyloid plaques and neurofibrillary tangles [15].

Brain levels of cholesterol and choline which are precursor of the neurotransmitter acetylcholine were shown to be reduced in AD [16]. Also an increased activity of acetylcholinesterase has been reported in AD [17]. Both previously mentioned changes may result in reduced acetylcholine level which may contribute to dementia.

Acetylcholinesterase inhibitors, which enhance cholinergic transmission by reducing the enzymatic degradation of acetylcholine, are actually the most important way for reducing the risk of AD [18] together with antioxidant and anti-inflammatory agents may have potential beneficial effects towards AD.

The aim of the present study is to evaluate in-vitro antioxidant and cholinesterase inhibiting activity and in-vivo anti-inflammatory effect of different fractions of selected plant food. The promissing fractions may have collectively potential beneficial effect as functional food components towards AD. The aim included determination of total phenolic content of the studied plants and the possible active constituents of lipid compartment of the most efficient fraction.

MATERIALS AND METHODS

Materials

Plant materials

The plant materials used in this study were the leaves, seeds and fruits of Carica papaya L. family Caricaceae (papaya), the herb of Origanum majorana L. family Lamiaceae (marjoram), leaves and fruits (seedless) of Vitis vinifera L. family Vitaceae (grape), fruits of Ficus carica L. family Moraceae (fig) and the rhizome of Zingiber officinale family Zingiberaceae (ginger). All plant materials were purchased from local market in Giza city, Egypt except for papaya which was obtained from Ministry of Agriculture, Egypt.

Animals

Female albino rats of sprague-Dawley strain of 109 g ± 1.455 Mean ± SE body weight were used in acute inflammation test and were maintained on laboratory stock diet. Animals were kept individually in stainless steel cages at room temperature of about 25 ±2 ºC, food and water were given ad-libitum. Rats were supplied by the animal house of the National Research Centre, Egypt.

Major chemicals

- D,L α-tocopherol, β-carotene, linoleic acid, tween 20 and Folin-Ciocalteu reagent, all were purchased from Sigma (USA), petroleum ether 40-60ºC and methyl alcohol from BDH Chemical Co, England.
- λ-Carrageenan, Type IV (Sigma, USA): One percent of λ-carrageenan in saline was freshly prepared for induction of acute inflammation
- Acetylthiocholiniodide, 5,5′-dithio-bis-2-nitrobenzoic acid (DTNB, Ellman's reagent) was obtained from Fluka Bio-Chemika, Switzerland.

Methods

1- Preparation of Plant Materials

Fruits and leaves of Carica papaya and grape, fig and Origanum majorana herb were all washed by tap water. Carica papaya fruit was peeled and its pulp was cut into small slices, papaya seeds were separated. Also figs were cut into small pieces. All the studied plant parts were dried separately in an air-circulated oven at 40 ºC till complete dryness. All dried plant materials were reduced separately into powder form as far as possible and subjected to successive extraction using soxhlet apparatus.

2- Preparation of Plant Extracts

A known weight of each of the dried plants under study was placed separately in a continuous extraction apparatus (Soxhlet) and subjected to successive extraction using petroleum ether (40-60 ºC) then absolute methanol. Complete extraction has been verified when the extracting solvent became colorless and tested by evaporating small aliquot from it to dryness in a glass watch till no residue was obtained. For each extract the solvent was completely removed by distillation under reduced pressure using rotary evaporator and dried to a constant weight in a vacuum dessicator over anhydrous calcium chloride.

3- Preparation of the Extracts' Doses for Acute Inflammation Test

The dry methanolic extracts of the studied plants were dissolved separately in distilled water, whereas the dry petroleum ether extracts were suspended in distilled water using gum acacia. Only one dose (500 mg/kg rat body weight) of each plant extract was used in the acute inflammation test.

In-vitro antioxidant activity using β-carotene bleaching method [19]

Antioxidant activity of the different extracts was determined according to the β-carotene bleaching method using D-L-α-tocopherol as standard. One ml of β-carotene solution (0.2 mg/ml chloroform) was transferred to different round-bottom flasks (100 ml) containing 0.02 ml linoleic acid and 0.2 ml tween 20. Each mixture was then dosed with 0.2 ml of 80 % MeOH (as control) or α-tocopherol (50 mg/L) (as standard) or the plant extracts. After evaporation to dryness under vacuum at room temperature, 50 ml of oxygenated distilled water was added to each flask and the mixture was shaken to form a liposome solution. The samples were then subjected to thermal autoxidation at 50˚C for 2h. The absorbance of the samples at 470 nm was measured immediately after their preparation before thermal auto oxidation (t = 0 min) and at the end of the experiment (t = 120 min) using UVPC spectrophotometer. All samples were assayed in duplicate and the mean was calculated. Antioxidant activity (AA) was calculated as percent inhibition of oxidation relative to control sample, using the following equation [20]

$$AA = \frac{R_{control} - R_{sample\ or\ standard}}{R_{control}} \times 100$$

where $R_{control}$ **and** $R_{sample\ or\ standard}$ were the bleaching rates of *β*-carotene in reactant mixture of the control and sample or standard, respectively.

In- vitro acetylcholinesterase inhibiting activity

The purpose of this assay is to screen plants' extracts for inhibition of Acetylcholinesterase activity. Inhibitors of this enzyme may be useful for the treatment of AD. Acetylcholinesterase inhibiting activity was determined according to the method of Vogel and Vogel [21] which is a modification of Ellman [22] procedure.

Tissue preparation

Male albino rats were decapitated, brains were rapidly removed, corpora striata dissected free, weighed and homogenized in 19 volumes of 0.05 M phosphate buffer pH 7.2. A 25 µl aliquot of this suspension is added to 1 ml of different plants' extracts or the vehicle and re-incubated for 10 min at 37 ºC.

Enzyme activity was measured at 412 nm using the UVPC spectrophotometer. Blank values were determined for each run to control for non-enzymatic hydrolysis of substrate and these values were subtracted from that of all samples and control. The change in absorbance for 6 min for control and samples were read and used for calculating the inhibiting activity, through plotting the absorbance against time and the slope was calculated.

Calculation

$$\% \text{ Inhibition} = \frac{\text{Slope of the control} - \text{slope of the plant extract}}{\text{Slope of the control}} \times 100$$

In-vivo anti-inflammatory activity using carrageenan model of acute inflammation

Evaluation of the anti–inflammatory activity of different plant extracts under investigation was carried out using carrageenan model of acute inflammation

- Rats maintained on laboratory stock diet were fasted for 16 hrs before starting the experiment and divided into 17 groups, each comprised six rats.

The groups were:

- Two control groups where rats received no plant extract but only given the vehicle.
- Test groups, 15 groups where rats of the different groups were given one oral dose (500 mg/kg rat body weight) of either methanol or petroleum extract of Origanum majorana, Carica papaya (seed, fruit and leaves), fig, ginger and grape (fruits and leaves).
- After an hour of the oral administration of extract or the vehicle, all rats of test and control groups were injected into the sub-planter region of the right hind paw (foot) with 1% λ- carrageenan suspension (0.05 ml / animal) [23]**.**
- Paw thickness was measured using vernier calipers immediately before the injection of carrageenan (Zero time) and after 30 min, 1, 1.5, 2, 3 and 4 hours of carrageenan injection.
- The thickness of inflammation was calculated by subtracting paw thickness at zero time from paw thickness at different time intervals for each rat.
- The mean thickness of inflammation of the hind paw of rats given different plant extracts was compared with that of the control inflamed rats by applying the statistical analysis of the t-student's test.

Extraction and determination of total phenolic content (TPC)

TPC was extracted from the dry powder samples of the plant foods under study according to the method of **Velioglu *et al.* [19]**. Each sample (200 mg.) was extracted separately with 2 ml of methanol (80%) containing 1% HCl at room temperature in a shaker for 2 hours. Then, centrifuged at 3000 r.p.m for 10 min. The upper layer was collected in different clean tubes and re-extraction of the residue was carried out using the same previous procedure. The second extract was added to the first and used for determination of TPC. Total phenolics were determined colorimetrically in the extracted samples using Folin-Ciocalteu reagent [24]**.** The reaction mixture contained 200 ul of extracted samples, 1000 ul of freshly prepared diluted Folin-Ciocalteu reagent and 800 ul of sodium carbonate solution (7.5%) were mixed and kept in the dark at room temperature for 30 min to complete the reaction. Absorbance was measured at 765 nm using UVPC spectrophotometer. Gallic acid was used as a standard and results were calculated as mg gallic acid equivalent per gm of dry sample. The reaction was conducted in triplicate and results were averaged.

Determination of the active constituents in the unsaponifiable matter of lipid fraction of ginger [25].

Five grams of lipid fraction of ginger was saponified by refluxing with 10% alcoholic potassium hydroxide. After dilution with distilled water, the unsaponifiable fraction was extracted with ether. Both aqueous (saponifiable) and nonaqueous portions (unsaponifiable) were separated in separating funnel. The ether was evaporated, and the extract was weighed and analysed by G.L.C. GLC conditions were; column: 10% OV-101 packed column; stationary phase: chromosorb WHP; detector temperature: 290ºC; injector temperature, 28ºC; carrier gas N_2; flow-rate 30 ml/min; air flow-rate: 300 ml/min; H_2; flow-rate 30 ml/min; detector FID; chart speed: 0.5 cm/min; oven program: initial temperature, 70ºC; final temperature, 270ºC, total time, 85 min. Identification of hydrocarbons and sterols contents of the unsaponifiable fraction was carried out by comparison of their retention times with the co-injected reference phytosterols and hydrocarbons. Quantification was based on peak area integration.

RESULTS

The antioxidant activity of different extracts tested in the present study are shown in Table (1). It can be noted that the highest antioxidant activity belonged to methanol extract of ginger (88%), Carica leaves (85%) and Origanum (74%). Petroleum ether extract of ginger and Carica leaves were more or less of the same antioxidant activity (72% and 73% respectively). Methanol extract of grape leaves and fruit (raisin) were 65% and 66% respectively. The antioxidant activity of petroleum ether extract of grape leaves and Origanum was 64% and 59% respectively. Petroleum ether extract of Carica fruit showed 53% antioxidant activity. The least antioxidant activity was attributed to petroleum ether extract of Carica seed, methanol extract of Carica fruit, Carica seed and fig and petroleum ether extract of fig (50%, 40%, 37%, 38% and 26% respectively).

Table (1): Antioxidant activity of different plant extracts

Sample	Antioxidant activity %(AA %)
Methanol extract of ginger	88
Methanol extract of Carica papaya leaves	85
Methanol extract of Origanum majorana	74
Petroleum ether extract of Carica papaya leaves	73
Petroleum ether extract of ginger	72
Methanol extract of grape fruit (raisin)	66
Methanol extract of grape leaves	65
Petroleum ether extract of grape leaves	64
Petroleum ether extract of Origanum majorana	59
Petroleum ether extract of Carica papaya fruit	53
Petroleum ether extract of Carica papaya seed	50
Methanol extract of Carica papaya fruit	40
Methanol extract of fig	38
Methanol extract of Carica papaya seed	37
Petroleum ether extract of fig	26
Standard (D,L α- tocopherol (50mg/L)	92

Table (2): Acetylcholinesterase inhibiting activity

Plant extract	% Inhibition
Petroleum ether extract of ginger	85
Petroleum ether extract of Carica seeds	73
Methanol extract of grape fruits	66
Petroleum ether extract of Carica leaves	65
Petroleum ether extract of fig	64
Methanol extract of ginger	49
Methanol extract of Carica fruit	49
Methanol extract of fig	45
Methanol extract of Origanum	44
Methanol extract of grape leaves	32
Methanol extract of Carica seeds	32
Petroleum ether extract of grape leaves	30
Petroleum ether extract of Origanum	23
Methanol extract of Carica leaves	12
Petroleum ether extract of Carica fruit	4

The acetylcholinesterase inhibiting activity of different plant extracts are shown in Table (2). Petroleum ether extract of ginger, petroleum ether extract of Carica seed and methanol extract of grape fruit produced the highest inhibition of acetylcholinesterase activity (85%, 73% and 66% respectively). Petroleum ether extract of Carica leaves and fig have nearly the same effect (65% and 64% respectively). Also it was shown that both, methanol extract of ginger and Carica fruit have equal effect (49%). Methanol extract of fig and Origanum were more or less of the same effect (45% and 44% respectively). Whereas methanol extract of grape leaves and Carica seeds were shown to have similar effect (32%). Finally, petroleum ether extract of grape leaves, Origanum, Carica fruit, and methanol extract of Carica leaves showed the least anti-cholinesterase activity (30%, 23%, 4% and 12% respectively).

The results of acute inflammation are present in Tables (3, 4). In table 3, mean hind paw thickness of rats of the different experimental groups can be seen, table 4 showed the calculated inflammation thickness at different time intervals.

In the present study different plant extracts were tested in carrageenan model in rats. It was noticed that methanol extract of Carica fruit showed the most potent anti-inflammatory activity; its significant anti-inflammatory effect started 0.5 hr after carrageenan injection (40%) and increase gradually till reach its maximum activity (68%) after 4 hrs from injection. Methanol extract of grape leaves and figs followed methanol extract of Carica fruit in potency as anti-inflammatory agent. The anti-inflammatory activity profile of both methanol extract of grape leaves and petroleum ether extract of Carica leaves was similar where both showed significant activity after 0.5 hr from carrageenan injection and reach their maximum activity after 1 hr (61% and 52% respectively). The activity started to decline 1.5 hr after carrageenan injection till 4 hrs in case of grape leaves whereas on Carica leaves extract administration it showed slight increase again after 4 hrs. Both methanol extract of grape fruit and Carica seed exhibited similar activity profile as their significant anti-inflammatory activity started one hr after carrageenan injection and continued increasing until the 4^{th} hr. Methanol and petroleum ether extract of ginger exhibited similar activity profile in that both started their significant activity 1.5 hr after carrageenan injection and increased till reach their maximum activity after 4 hrs (64% and 59% respectively). The methanol extract of fig and Carica leaves in addition to the petroleum ether of fig showed similar anti-inflammatory activity, where their significant activity started 0.5 hr after carrageenan injection and reach their maximum activity 1.5 hr after injection (57%, 51% and 41% respectively), their activity started to decline on the 2^{nd} hr from injection and showed slight increase in activity on the 4^{th} hr but methanol extract of fig possess much more potent activity. The petroleum ether extract of Carica fruit and grape leaves showed weak significant anti-inflammatory activity which started 0.5 hr after carrageenan injection. It is worthy to mention that both methanol and petroleum ether extract of Origanum majorana have the least anti-inflammatory activity (when taking into account the whole studied period) their maximum significant activity was shown on the 3^{rd} hr from carrageenan injection which was equal to 42%. Petroleum ether extract of Carica seed started its significant activity 1.5 hr after carrageenan injection, its activity showed fluctuation till the 4^{th} hr from injection.

Table (5) showed total phenolic contents of different plant materials as mg gallic acid equivalent per g. dry sample (mg of GAE/g). The highest phenolic contents were attributed to grape leaves followed by Origanum herb then Carica leaves(93.52, 77.93 and 41.1mg of GAE/g of dry weight, respectively). Carica fruit, ginger, Carica seed and grape fruit (raisin) contain medium level of phenolic contents (30.29, 29.29, 26.70 and 23.75 mg of GAE/g of dry weight respectively). It was shown that fig possess the least phenolic content (14.27 mg of GAE/g of dry weight).

The unsaponifiable matter of lipid fraction of ginger was found to be 40%. GLC analysis of such unsaponifiable matter is shown in Table (6). The total identified sterols were 0.738% including campesterol, stigmasterol and beta-sitosterol. Total hydrocarbons were 86.242% of total unsaponifiable matter, the highest percentage was attributed to C15 hydrocarbon (51.938%).

Table (3): Mean hind paw thickness (mm) at different time intervals of carrageenan injection after administration of natural anti-inflammatory agents

GROUPS		TIME						
		Zero	30min	1 hr	1.5hr	2 hr	3 hr	4 hr
Control	Mean	0.3	0.508	0.583	0.608	0.608	0.62	0.642
	±SE	0	0.008	0.028	0.024	0.024	0.021	0.024
MeOH Ext of raisin	Mean	0.3	0.483	0.483	0.442	0.450	0.466	0.450
	±SE	0	0.011	0.017	0.015	0.018	0.017	0.018
MeOH Ext of fig	Mean	0.3	0.467	0.458	0.433	0.450	0.458	0.450
	±SE	0	0.017	0.015	0.017	0.018	0.020	0.029
MeOH Ext of Carica fruit	Mean	0.3	0.425	0.408	0.417	0.408	0.417	0.408
	±SE	0	0.011	0.008	0.011	0.008	0.011	0.027
MeOH Ext of Carica leaves	Mean	0.3	0.450	0.450	0.450	0.458	0.483	0.475
	±SE	0	0.022	0.029	0.029	0.030	0.021	0.031
MeOH Ext of grape leaves	Mean	0.3	0.450	0.408	0.433	0.442	0.466	0.483
	±SE	0	0.018	0.008	0.021	0.020	0.036	0.033
PE Ext of fig	Mean	0.3	0.442	0.466	0.483	0.525	0.542	0.542
	±SE	0	0.015	0.011	0.017	0.011	0.020	0.015
PE Ext of Carica fruit	Mean	0.3	0.458	0.492	0.516	0.525	0.542	0.542
	±SE	0	0.020	0.015	0.021	0.025	0.035	0.024
PE Ext of Carica leaves	Mean	0.3	0.433	0.433	0.483	0.492	0.500	0.500
	±SE	0	0.017	0.025	0.028	0.037	0.039	0.037
PE Ext of grape leaves	Mean	0.3	0.467	0.508	0.516	0.508	0.542	0.566
	±SE	0	0.017	0.015	0.031	0.024	0.037	0.051
Control	Mean	0.3	0.475	0.500	0.542	0.558	0.600	0.625
	±SE	0	0.021	0.022	0.024	0.015	0.026	0.017
MeOH Ext of ginger	Mean	0.3	0.433	0.458	0.442	0.408	0.433	0.416
	±SE	0	0.017	0.008	0.015	0.008	0.021	0.017
PE Ext of ginger	Mean	0.3	0.450	0.442	0.467	0.467	0.425	0.433
	±SE	0	0	0.015	0.011	0.011	0.011	0.017
MeOH Ext of Origanum	Mean	0.3	0.492	0.500	0.510	0.483	0.475	0.492
	±SE	0	0.015	0.018	0.020	0.021	0.021	0.030
PE Ext of Origanum	Mean	0.3	0.475	0.492	0.483	0.525	0.475	0.492
	±SE	0	0.021	0.015	0.011	0.017	0.028	0.027
MeOH Ext of Carica seed	Mean	0.3	0.458	0.442	0.425	0.433	0.442	0.458
	±SE	0	0.015	0.008	0.017	0.021	0.020	0.024
PE Ext of Carica seed	Mean	0.3	0.450	0.467	0.442	0.442	0.475	0.475
	±SE	0	0.018	0.031	0.020	0.015	0.031	0.031

Table (4): The thickness of inflammation of the hind paw (mm) at different time intervals of carrageenan injection after administration of natural anti – inflammatory agents in comparison to control inflamed rats.

GROUPS		TIME					
		30min	1 hr	1.5hr	2 hr	3 hr	4 hr
Control	Mean	0.208	0.280	0.308	0.308	0.317	0.342
	±SE	0.008	0.028	0.024	0.024	0.021	0.024
MeOH Ext of raisin	Mean	0.183	0.183**	0.142****	0.150****	0.167****	0.150****
	±SE	0.011	0.017	0.015	0.018	0.017	0.018
	%inhibition	12	35	54	51	47	56
MeOH Ext of fig	Mean	0.167*	0.158*** *	0.133****	0.150****	0.158****	0.150****
	±SE	0.017	0.015	0.017	0.018	0.020	0.029
	%inhibition	20	44	57	51	50	56
MeOH Ext of Carica fruit	Mean	0.125****	0.108*** *	0.117****	0.108****	0.117****	0.108****
	±SE	0.011	0.008	0.011	0.008	0.011	0.027
	%inhibition	40	61	62	65	63	68
MeOH Ext of Carica leaves	Mean	0.150*	0.150***	0.150****	0.158****	0.183****	0.175****
	±SE	0.022	0.028	0.028	0.030	0.021	0.031
	%inhibition	28	46	51	49	42	49
MeOH Ext of grape leaves	Mean	0.150**	0.108*** *	0.133****	0.142****	0.167****	0.183****
	±SE	0.018	0.008	0.021	0.020	0.036	0.033
	%inhibition	28	61	57	54	47	46
PE Ext of fig	Mean	0.142****	0.167*** *	0.183****	0.225***	0.242*	0.242***
	±SE	0.015	0.011	0.017	0.011	0.020	0.015
	%inhibition	32	41	41	27	24	29
PE Ext of Carica fruit	Mean	0.158*	0.192**	0.217**	0.225*	0.242	0.242**
	±SE	0.020	0.015	0.021	0.025	0.035	0.024
	%inhibition	24	32	30	27	24	29
PE Ext of Carica leaves	Mean	0.133****	0.133*** *	0.183***	0.192**	0.200**	0.200***
	±SE	0.017	0.025	0.028	0.037	0.039	0.037
	%inhibition	36	52	41	38	37	41
PE Ext of grape leaves	Mean	0.167*	0.208*	0.217*	0.208**	0.242	0.267
	±S.E	0.017	0.015	0.031	0.024	0.037	0.051
	%inhibition	20	26	30	33	24	22
Control	Mean	0.175	0.200	0.242	0.258	0.300	0.325
	±SE	0.021	0.022	0.024	0.015	0.026	0.017
MeOH Ext of ginger	Mean	0.133	0.158	0.142***	0.108****	0.133****	0.117****
	±SE	0.017	0.008	0.015	0.008	0.021	0.017
	% inhibition	24	21	41	58	56	64
PE Ext of ginger	Mean	0.150	0.142	0.167**	0.167****	0.125****	0.133****
	±SE	0	0.015	0.011	0.011	0.011	0.017
	% inhibition	14	29	31	35	58	59
MeOH Ext of Origanum	Mean	0.192	0.200	0.208	0.183**	0.175****	0.192****
	±SE	0.015	0.018	0.020	0.021	0.021	0.030
	% inhibition	-10	0	14	29	42	41
PE Ext of	Mean	0.175	0.192	0.183*	0.225	0.175***	0.192****

Origanum	**±SE**	0.021	0.015	0.011	0.017	0.028	0.027
	% inhibition	0	4	24	13	42	41
MeOH Ext of Carica seed	**Mean**	0.158	0.142*	0.125****	0.133****	0.142****	0.158****
	±SE	0.015	0.008	0.017	0.021	0.020	0.024
	% inhibition	10	29	48	48	53	51
PE Ext of Carica seed	**Mean**	0.150	0.167	0.142***	0.142****	0.175**	0.175****
	±SE	0.018	0.031	0.020	0.015	0.031	0.031
	% inhibition	14	17	41	45	42	46

Values significantly different from control: *: p<0.025, **: p<0.010, ***: p<0.005, ****: p<0.001.

Table (5): Total phenolic contents of the different plant materials used in the study.

Plant	Total phenolics as mg gallic acid equivalent/ g dry sample
Grape leaves	93.52
Origanum majorana	77.93
Carica leaves	41.1
Carica fruit	30.29
Ginger	29.29
Carica seed	26.70
Grape fruit	23.75
Fig	14.27

Table (6): Hydrocarbons and phytosterol of unsaponifiable matter of lipid fraction of ginger as percentage of total unsaponifiable.

Hydrocarbons:	%
C11	1.419
C12	0.273
C13	0.250
C14	1.955
C15	51.938
C16	3.617
C17	7.282
C18	1.934
C19	2.184
C20	0.957
C21	3.339
C22	0.973
C23	2.559
C24	2.479
C25	1.636
C26	0.721
C27	1.484
C28	0.792
C29	0.254
C32	0.196
Phytosterols:	0.189
Cholesterol	0.214
Campesterol	
Stigmasterol	0.109
Beta-sitosterol	0.226
Total Identified Hydrocarbons	86.242
Total Identified phytosterols	0.738

DISCUSSION

Increased brain oxidative stress is a key feature of AD and manifests predominantly as lipid peroxidation because of the high content of polyunsaturated fatty acids in central nervous system that are particularly susceptible to oxidation [26]**.** Also the central nervous system is particularly vulnerable to oxidative damage because of its high energy requirement, high oxygen consumption rate, and relative deficit in antioxidant defense system compared with other organs [27]. So antioxidants administration may have beneficial effects in AD [28]**.**

The drugs approved for the AD therapy act by counter acting the acetylcholine deficit, that is, they try to enhance the acetylcholine level in the brain [29]. Acetylcholine is involved in the signal transfer in the synapses. After being delivered in the synapses, acetylcholine is hydrolyzed giving choline and acetyl group in a reaction catalyzed by the enzyme acetylcholinesterase [30]**.** The molecular basis of the Alzheimer drugs used so far, take advantage of their action as acetylcholinesterase inhibitors [29]**.** Some of the drugs approved for therapeutic use show hepatotoxicity [31]**,** consequently there have been a continuous search for new safer natural agent in this respect. So, inhibitors of acetylcholinestarase activity are considered useful for the treatment of Alzheimer dementia [32, 33]. This is due to improvement of the level of acetylcholine transmitter that has been reported to be reduced in AD [34, 2].

Inflammation may play an important role in the pathogenesis of dementia. Studies reported an association between plasma levels of inflammatory markers and the risk of dementia and AD [35]. A variety of inflammatory proteins have been identified in brains of AD patients, including inflammatory cytokines, acute phase proteins and complement components [14, 36]. It was suggested that anti-inflammatory agent may have potential benefits towards AD [37].

Phenolic compounds have been reported to have multiple biological effects, including antioxidant activity and anti-inflammatory [38, 39]. The antioxidant activity of phenolics is related to a number of different mechanisms such as free radical scavenging, hydrogen donation, singlet oxygen quenching, metal ion chelation, and as acting as substrate for radical such as superoxide and hydroxide [40].

It has been reported previously that vitamin C, malic acid, citric acid and glucose are some of the possible antioxidant components in Carica [41]. Carica fruit has been shown previously to have antioxidative stress potential that was comparable to α-tocopherol [42]. In the present study both extracts of Carica fruits, leaves and seeds showed antioxidant activity which was the highest in case of methanol extract of Carica leaves (85%) and the lowest in case of methanol extract of the seed (37%). The antioxidant activity of methanol extract of leaves, fruits and seeds was proportional to their contents of phenolic compounds as shown in the present study. Five pigments (beta-carotene, lycopene, beta-cryptoxanthin, beta-cryptoxanthin myristoyl and lauroyl esters have been identified in the methanol extract of papaya [43], also Carica papaya was shown to contain α-tocopherol (111.3 mg/kg), these constituents may render papaya its antioxidant activity. The most potent anti-inflammatory activity in the present study was attributed to the methanol extract of Carica fruit among all the studied plants. Petroleum ether extract of Carica seed and leaves showed higher anticholineterase activity (73% and 65% respectively) than the other extracts of Carica papaya.

Origanum majorana L. herbs and their ethanol, n-hexane and supercritical CO_2 extracts have been shown previously to posses relatively strong antioxidant activity which has been attributed to phenolic contents [44]. In the present study antioxidant activity of methanol extract of Origanum was 74% while that of petroleum ether was 59%. While the acetylcholinesterase inhibition of the methanol extract in the present study was 44% and that of the petroleum ether extractwas only 23%. In a previous study it has been reported that ethanol extract of Origanum showed very high inhibitory effect on acetylcholinesterase which was ascribed to the presence of ursolic acid [32]. Ursolic acid, carnosic acid, and carnosol content of Origanum has also been reported to reduce oxidative stress [33, 44]. The phenolic content of Origanum in the current study showed high level (77.93 mg gallic acid equivalent/g dry sample) which support its effect as antioxidant. Origanum is rich in rosmarinic acid and hydroxycinnamic acid compounds which possess strong antioxidant activity [45]. In the present study both methanol and petroleum ether extract of Origanum showed low anti-inflammatory activity.

Thomson *et al.* [46] demonstrated in-vivo anti-inflammatory activity of ginger through reduction of prostaglandin E_2, an inflammatory mediator. It has been also reported that ginger extract may be useful in delaying the onset and the progression of neurodegenerative diseases specially AD through cell line assay. This was reflected through its anti-inflammatory and antioxidant effect [47]. Ginger has been shown to have potent antioxidant activity [48], which was claimed to be attributed to 6-gingerol a phenolic

compound that possess both antioxidant and anti-inflammatory activity [49]. It has also been demonstrated that biologically active constituents of ginger included vanillin, dihydroferulic acid, zingerone and ferulic acid [50]. Ginger was shown to have high concentration of melatonin; it also contains 6-dehydrogingerdione and curcumin which possess potent antioxidant effect [51, 52]. In the present study it has been shown that ginger not only possess anti-inflammatory and antioxidant activity but also acetylcholinesterase inhibiting activity which make it a good functional food for AD patients. Some of these activities may be related to its phenolic content that determined to be 29.29 mg gallic acid equivalent/g dry sample. Lipid fraction (petroleum ether extract) of ginger showed the highest anti-cholinesterase activity among the studied plant extracts. The unsaponifiable matter of lipid fraction of ginger in the current study was shown to contain campesterol, stigmasterol and sitosterol but in low percentage. Hydrocarbons of C15 represent 51.938% of the unsaponifiable matter.

Greg *et al*. [53] reported antioxidant and anti-inflammatory activity of grapes which have been attributed to the presence of polyphenol, flavonoids, beta-carotene, tocopherols and dietary fibers [54]. In the present study total phenolic contents of grape leaves was of the highest content (93.52 mg gallic acid equivalent/g dry sample) among the studied plants, however the content of the fruit was only 23.75 mg gallic acid equivalent/g dry sample. Grape leaves methanol extract ranked as having the second highest anti-inflammatory activity among the studied plants. Methanol extract of grape fruit also possess the third highest anticholinesterase activity (66%) among the studied plants. Extracts of grape leaves and fruits also showed high antioxidant activity ranged from 64-66%. In a previous study, Yilmaz and Toledo [55] reported the presence of important phytochemicals in grape skin (resveratrol, catechin, epicatechin, gallocatechin, gallic acid and ellagic acid) which possess potent antioxidant effect.

Fig fruits have been shown previously to have antioxidant activity, which correlated with total polyphenols, flavonoids and anthocyanins contents; cyanide-3-O-rhammoglucoside is the main anthocyanin in fig fruits [56, 57]. Total phenolic content of fig showed the lowest level (14.27 mg gallic acid equivalent/g dry weight) among the studied plants. Both extracts of fig showed anticholinesterase activity ranged from 45-64%. The anti-inflammatory activity of methanol extract was higher than that of the petroleum ether extract.

Conclusion. All the studied plants showed antioxidant, anti-inflammatory and anti-cholinesterase activity with variable degrees. The highest antioxidant and cholinesterase inhibiting activity were attributed to methanol and petroleum ether extract of ginger respectively. While methanol extract of Carica fruit was superior as anti-inflammatory agent. Combination of the previously mentioned extracts may have potential beneficial effect as functional food components towards Alzheimer' disease. The anti-inflammatory and antioxidant activity may be attributed to the presence of phenolic compounds in the studied plants.

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摘要：美国的法律规章，多数是相对合理的。但是，也有很多不合理的法律规章，甚至是恶法。一个典型的恶法，就是规定人每星期最多只能工作 40 小时，否则要多出这费那费比如超时工资费等。工作是每一个自由人最基本的人权之一，使用自己的时间工作生活是天经地义的天赋人权。每周共有 168 小时，凭什麽规定劳动者每周只能工作 40 小时，否则就要一堆附加条件？总统为了自己的生存利益每星期工作远远超过 40 小时，平民百姓为什麽不能呢？只要雇主雇员共同同意，并且没有强迫或欺骗，人完全没有必要一定要限制每周工作少于 40 小时或规定最低工资。重要的，限制人们的工作时间，显然是社会人力资源的浪费，也是社会（比如美国）竞争力低下的重要因素，是衰退的重要原因。[Academia Arena, 2009;1(2):69-71]. ISSN 1553-992X.

关键词：法律；美国；工资；最低

作为一个所谓的法制国家，美国的法律规章随时在影响与制约着社会存在的各个方面。这繁多的法律条文，多数还是相对合理的。但是，也有很多不合理的法律规章，甚至是恶法。一个典型的恶法，就是的欺行霸市的法律规定人每星期最多只能工作 40 小时，否则要多出这费那费比如超时工资费等。工作是每一个自由人最基本的人权之一，使用自己的时间工作生活是天经地义的天赋人权。每周共有 168 小时，凭什麽规定劳动者每周只能工作 40 小时，否则就要一堆附加条件？去问一问美国那些制定法律执行法律的总统州长议员们，他（她）们有哪一个每周工作少于 40 个小时？竞选也是工作。民主党人士可以要求约翰·麦凯恩每周工作不超过 40 小时吗？共和党人士可以要求巴拉克·奥巴马每周工作不超过 40 小时吗？麦凯恩、奥巴马为了自己的竞选利益每星期工作远远超过 40 小时，平民百姓为什麽不能呢？只要雇主雇员共同同意，并且没有强迫或欺骗，人完全没有必要一定要限制每周工作少于 40 小时或规定最低工资。重要的，限制人们的工作时间，显然是社会人力资源的浪费，也是社会（比如美国）竞争力低下的重要因素，是衰退的重要原因。

人类社会，自然是由人所组成的。是人就有对与错。任何国家地区及人员，在任何历史时期，都有其值得肯定的一些方面，也会有错误行为。比如美国，作为当今的世界第一强国，无论在国际国内方面，都有一些值得肯定的行为与影响，也有很多错误的行为，我们简称其错行。比如美国的错行之一，就是所谓的最低工资法。

劳动作为一种商品，其价格是工资率， 即：月薪/年新/小时工资/计件工资等。制定最低工资实质上是一种政府对价格进行管制的行为，是劳务价格垄断，是错误的法规。最低工资法也是世界上最不讲理的法规之一。

1. 最低工资法的实质，首先是侵犯人权，有违公平法则，即最低工资法违反人权的基本原则。劳动力本身是一种商品，由劳动者自己完全所有。在不被欺骗不被强迫的情况下，劳动者本身作为人，具有完全的权利决定自己的劳动的出售价格。但是，所谓的最低工资法却断然以法律的形式规定了劳动者出售自己劳动的价格，进行价格管制和价格垄断，剥夺了劳动者决定自己劳动出售的这一天赋人权。人连自己劳动的出售价格都要由立法者决定，人权还在哪里？

2. 表面上最低工资法保护劳工得到起码的最低工资，实际上是剥夺了一些劳工的工作机会。假定最低工资是每小时 7 美元。如果一个人找不到或没有能力完成每小时 7 美元的工作，而受能力或机会条件的限制，他可以为某一个公司工作但每小时只能创造 6 美元的价值，这个公司老板怎麼办？让他为这个公司工作但每小时依法给 7 美元？这样他为公司每工作 1 小时，公司亏损 1 美元。公司显然不能进行这样的亏损性经营。如果公司让他工作但每小时发 6 美元，即使公司一分钱不赚，还违犯劳工法。这样公司只好不雇佣他工作，其结果首先就是他被最低工资法剥夺了工作权利和机会。虽然他不能工作或许对其他劳工有好处（竞争），但对他而言即使每小时挣 6 美元当然也比没工作好。而且，工作挣钱只是工作目的的一部分。一个人有机会进行一项工作，还使他得到参与社会、获得新的学习训练、得到工作乐趣等等机会。既然劳动力市场上有人愿意为更低的工资来工作，那么对那个人来说所谓的最低工资就不是低得不能忍受了。如果社会市场上没人愿意为更低的工资来干活，那么根本没有必要法定那个最低工资为下限。只要社会上有一个失业者，就不应该有最低工资法，否则就是对这个失业者的不公平。

3. 最低工资法限制了一些人的工作权利与机会，相应的就限制了社会财富的创造数量。一个人，如果他的能力和机会所限使得他不能创造出高于所谓最低工资的价值，按照最低工资法他就无权利工作，但又不能杀死他，他还是要消耗社会财富以维持生存。这样的情况下，当然不如让他进行自己力所能及的工作，而不应该是定个最低工资法规定他如果工作就违法。只要没有欺骗或者强迫，工资的高低应该完全由劳务买卖双方商定，而不是价格管制。

4. 最低工资法有害一个国家地区的发展。你一个国家一个地区规定最低工资，但你不能要求其它国家地区作同样的法律规定，尤其是在现在全球化的大形势下，规定较高的最低工资自然使生产成本提高，产品竞争力必然较低。现在美国很多企业搬到中国印度墨西哥进行生产，也就不足为奇。其后果，引起经济衰退。

5. 最低工资法表面上是说要保护劳工利益，实际上是损害当事人利益，自称在帮助穷人而制定的最低工资法，不仅无助于减轻贫困，最低工资的规定还会引起市场对劳动力需求的减少，导致失业人数的增加。因为在执行最低工资法规后，企业雇佣劳动的成本增加了，利润最大化的动机驱使企业裁员，这时使部分所谓能力较低的弱势工人遭到解雇的厄运，导致劳动力的就业状况恶化。

6. 最低工资法并不是人类现代文明的表现，其根源来自远古。自从人类由了商品交换以来，因为人的本性，就有一种希望或要求别人的同类商品价格不要高于自己的欲望，以便自己的东西好卖出去。从中国的哈尔滨到三亚，从美国的纽约到洛杉矶，你都可见到一些流氓市霸、市井无赖，他们可能会横行几条街，自己卖白菜两块一斤，但不许别人卖一块五，如果有人比他卖的价钱低的话，会找几个小流氓砸摊子甚至打卖主打买主，警察来了还找不到谁砸的摊子。所谓最低工资法，则是上升到法律的高度，规定自己的劳动卖每小时七块，别人的劳动就不能卖每小时六块五，否则买主卖主一起抓，起诉你违反最低工资法。所以可见，这最低工资法比市井无赖还流氓，是以法律的手段欺行霸市耍无赖。

7. 最低工资法是政客讨好已有工作者的工具。公共政策是社会各种力量博弈竞争的产物，其实质是社会利益格局的调整。政客们就利用社会利益的分配，来为自己的选票服务。

下面表述很真切：万一我沦落到要讨饭，那么您不要禁止我讨饭，那只会进一步伤害我。如果我给人擦鞋，请不要规定我力所不及的最低工资。如果您爱护我，就请保护我追求最好生活的权利 – 擦鞋，以及保护我的顾客用最便宜的价格购买服务的权利 – 被擦鞋。

最低工资法实质上反人权、极错误，但受到包括美国的很多国家推崇，值得深思。美国的最低工资法情况如下，供参考：1938年，美国国会通过《公平劳动标准法》，明确规定最低工资标准为每小时25美分，标志着最低工资问题进入美国联邦的立法领域。随着时间的推移，最低工资标准的覆盖

范围不断扩大，最低工资标准也随时间不断提高。1990年国会通过法案，规定最低工资标准为每小时4美元25美分，1996年又把最低工资标准提高到每小时5美元15美分。直到2007年1月10日，美国国会参众两院通过法案，把最低工资标准从每小时5美元15美分提高到7美元25美分。在美国，除了联邦制定最低工资标准外，许多州和市也制定自己的最低工资标准，但不能低于联邦的标准。目前，美国有20多个州的最低工资水平高于联邦标准。有关最低工资标准的法律还规定，超时工资标准为正常工资的1.5倍。国际上，法国和英国的最低工资标准是每小时7欧元，相当于9美元。

由于美国对外用兵等造成的人权信誉危机及最近的金融经济危机等困境，可以考虑取消最低工资法以提高人权信誉及降低生产成本，避免政治与经济衰退。

中国则更要引以为戒，不要推行有违人权理念有损经济发展的所谓最低工资法。

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Overtime Work Law

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Abstract: In the United Stats, there is a law to restrict people's work time. This law is against the human right, and against freedom. How long time a person to work in one week, this is a person right. Any law to deprive the right for people to arrange time for work, the law deprives human right. [Academia Arena, 2009;1(2):69-71]. ISSN 1553-992X.

Keywords: USA; law; work; time

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Life

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Abstract: To the life, the most important are two points: live and die. Conventionally, everybody of us thinks that all the life has a beginning as the birth and the end as the die. All plants and animals, including all the people must die. But, it is found that there is an animal named Turritopsis nutricula (a jellyfish) is immortal and this jellyfish can live forever. So the concept of our life property must be changed. Life is a physical and chemical process, it can be changed to non-life, also can keep the life forever. [Academia Arena, 2009;1(2):72-84]. ISSN 1553-992X.

Keywords: life; immortal; live; die

1. Introduction

We are life. To understand the nature of life is always a exciting topic in the human history. But, what life is? It never has a clear answer in the human history. As most people agree, life is a condition that distinguishes organisms from non-living objects, such as non-life, and dead organisms, being manifested by growth through metabolism and reproduction. Some living things can communicate and many can adapt to their environment through changes originating internally. A physical characteristic of life is that it feeds on negative entropy. In more detail, according to physicists such as Erwin Schrödinger, John Bernal, Eugene Wigner and John Avery, life is a member of the class of phenomena which are open or continuous systems able to decrease their internal entropy at the expense of substances or free energy taken in from the environment and subsequently rejected in a degraded form. From the biochemistry and molecular biology points, life is the chemical materials to exist in the earth that has neither special physic nor chemical property which is different from non-life. I insistant this point (Ma and Cherng, 2005).

From ontology aspect, the world is timeless and the life exists forever as any other body in the nature (Ma, 2003). The nature of life is that life is a process of negative entropy, evolution, autopoiesis (auto-organizing), adaptation, emergence and living hierarchy. Up to now, there is no scientific evidence to show that life body and non-life body obey the same natural laws. But, all the researches are made by the methods of biology, biochemistry and molecular biology, etc. It is very possible that the life and non-life are essential different in the biophysics, i.e. the quantum level. In the future, it is possible to make artificial life by either biological method or electronic technique, and keep life live forever, like Turritopsis nutricula.

Life is unique in the known universe, which is in a diversity of forms ranging from bacteria to human. The life organisms exist in everywhere of the earth. The first forms of life on earth spontaneously arose out of a preexisting prebiotic chemical soup. Individual living organisms maintain their self-identity and their self-organization while continually exchanging materials and energy and information with their environment. It is really different between the life and non-life bodies, but nobody knows what the exact difference it is, even this is one of the most important issues that attracted people in the whole human history. There are millions of people are working in life science researches, many with Ph.D. degree. More money has been spent in the life science studies than that spent in any other fields. Nature, Science, and other big journals published more papers in life science than the papers in any other topic. But, there are very few people are thinking about the nature of life. This topic has attracted thinkers since the beginning of human history, but ignored by the modern society. Most philosophers ignore the issue today, perhaps because it seems too scientific. At the same time, most scientists also ignore the issue, perhaps because it seems too philosophical. The nature of life is not clear for the current intelligence. It is a topic of philosophy, and also of biology (Bedau, 2005). However, it is very difficult to get financial support for the study of nature of life.

On the Earth, common life normally are: plants, animals, fungi, protists, archaea and bacteria, viruses, etc. All the life are composed of carbon, water, etc. to form the cells form with complex

organization and heritable genetic information. The life undergoes metabolism, possess a capacity to grow, respond to stimuli, reproduce and, through natural selection, adapt to their environment in successive generations. An entity with the above properties is considered to be a living organism. However, not every definition of life considers all of these properties to be essential. In the life, virus is not cell.

2. Definition of Life

As the life is too complex and too many things are not clear, there is no universal definition of life. There is debate in the definition of the life. It is difficult to give an exact definition for the life, as the nature of life is not clear. As the references, here I give the definition from some dictionaries:

(1) My definition on the life

- Spiritual existence transcending physical death; the period from birth to death; the quality that makes living animals and plants different from dead organisms and inorganic matter. Its functions include the ability to take in food, adapt to the environment, grow, and reproduce (Encarta® World English Dictionary, 2005).
- The condition that distinguishes animals and plants from inorganic matter, including the capacity for growth and functional activity (Compact Oxford English Dictionary, 2005).
- The property or quality that distinguishes living organisms from dead organisms and inanimate matter, manifested in functions such as metabolism, growth, reproduction, and response to stimuli or adaptation to the environment originating from within the organism (Dictionary.com, 2005).

(2) Conventional definition:

Life is a characteristic of organisms that exhibit the following phenomena:

- **Homeostasis**: Regulation of the internal environment to maintain a constant state; for example, sweating to reduce temperature.
- **Organization**: Being composed of one or more cells, which are the basic units of life.
- **Metabolism**: Consumption of energy by converting nonliving material into cellular components and decomposing organic matter. Living things require energy to maintain internal organization (homeostasis) and to produce the other phenomena associated with life.
- **Growth**: Maintenance of a higher rate of synthesis than catalysis. A growing organism increases in size in all of its parts, rather than simply accumulating matter. The particular species begins to multiply and expand as the evolution continues to flourish.
- **Adaptation**: The ability to change over a period of time in response to the environment. This ability is fundamental to the process of evolution and is determined by the organism's heredity as well as the composition of metabolized substances, and external factors present.
- **Response to stimuli**: A response can take many forms, from the contraction of a unicellular organism when touched to complex reactions involving all the senses of higher animals. A response is often expressed by motion, for example, the leaves of a plant turning toward the sun or an animal chasing its prey.
- **Reproduction**: The ability to produce new organisms. Reproduction can be the division of one cell to form two new cells. Usually the term is applied to the production of a new individual, although strictly speaking it also describes the production of new cells in the process of growth.

(2) Proposed definition:

- Living things are systems that tend to respond to changes in their environment, and inside themselves, in such a way as to promote their own continuation.
- Life is defined as a network of inferior negative feedbacks subordinated to a superior positive feedback.
- Life is a characteristic of self-organizing, self-recycling systems consisting of populations of replicators that are capable of mutation, around most of which homeostatic, metabolizing organisms evolve.
- Type of organization of matter producing various interacting forms of variable complexity, whose main property is to replicate almost perfectly by using matter and energy available in their environment to which they may adapt. In this definition almost perfectly relates to mutations happening during replication of organisms that may have adaptive benefits.

- Life is a potentially self-perpetuating open system of linked organic reactions, catalyzed simultaneously and almost isothermally by complex chemicals that are themselves produced by the open system.

3. Essential Conceptions of Life

The biological world is viewed as a hierarch of levels. These levels include chemicals, organelles, cells, organs, organisms, and ecologies. There are three conceptions for life: as a loose cluster of properties, a specific set of properties, and metabolization. There are many other opinions of life, such as that life is something of autopoiesis and self-replication, etc. Several hundred years ago, people thought that there was a vitalism inside life bodies that keep the body to be a life. The scientific results absolutely denied the existence of vitalism. The demise of vitalism told us that no super physical substance or force or spirit to distinguish any life from non-life. For all we know, all life phenomena obey to all the natural laws (physical and chemical) that adapted to the non-life world. There is no any extra natural law for the life world only. Life is no more unified than a collection of overlapping properties from overlapping disciplines, such as, biophysics, biochemistry, molecular biology, genetics, evolution, ecology, cytology, microbiology, physiology, anatomy and heredity, etc. However, the biophysics is poor result.

Farmer and Belin listed eight characteristics of the life: process, self-reproduction, information storage of self-representation, metabolism, functional interactions with the environment, interdependence of parts, stability under perturbations, and the ability to evolve. According to Farmer and Belin, life is a pattern of spacetime, rather than the specific identities of the atoms (Farmer, 1992).

Taylor described the properties of life: "Each property by itself, even when considered with others, is unable to clearly delineate the living from the non-living, but together they do help to characterize what makes living things unique" (Taylor, 1992).

Monod listed three characteristics of life: teleonomic or purposeful behavior, autonomous morphogenesis and reproductive invariance (Monod, 1971). Crick focused on the points related to: self-reproduction, genetics, evolution and metabolism (Crick, 1981). Küppers pointed life as: metabolism, self-reproduction and mutability (Küppers, 1985). Maynard Smith gave life two properties: metabolism and parts with functions (Maynard, 1986). Ray cited two aspects: self-reproduction and the capacity for open-ended evolution (Ray, 1992).

Mayr thought that the process of living could be defined by a list of the kinds of characteristics by which living organisms differ from inanimate matter:

(1) All levels of living systems have an enormously complex and adaptive organization.

(2) Living organisms are composed of a chemically unique set of macromolecules.

(3) The important phenomena in living systems are predominantly qualitative, not quantitative.

(4) All levels of living systems consist of highly variable groups of unique individuals.

(5) All organisms possess historically evolved genetic programs which enable them to engage in teleonomic processes and activities.

(6) Classes of living organisms are defined by historical connections of common descent.

(7) Organisms are the product of natural selection.

(8) Biological processes are especially unpredictable (Mayr, 1982).

(8) Life is continuum.

(9) All life organisms are programmed to death naturally, which is called apoptosis (Ma, 2005b).

Schrödinger persisted that the second law of thermodynamics plays key role in the process of metabolization. The following sentences give his opinions: What is the characteristic feature of life? When is a piece of matter said to be alive? When it goes on doing something, moving, exchanging material with its environment, and so forth, and that for a much longer period than we would expect an inanimate piece of matter to keep going under similar circumstances. How does the living organism avoid decay? The obvious answer is: By eating, drinking, breathing and assimilating. Linguistically, the scientific term of life is metabolism. The essential thing in metabolism is that the organism succeeds in freeing itself from all the entropy (Schrödinger, 1969).

4. Origin of Life

Life on Earth has existed for about 3.7 billion years. Plausible pre-biotic conditions result in the creation of the basic small molecules of life. This was demonstrated in the Miller-Urey experiment, and in the work of Sidney Fox. Phospholipids spontaneously form lipid bilayers, the basic structure of a cell

membrane. Procedures for producing random RNA molecules can produce ribozymes, which are able to produce more of themselves under very specific conditions.

When the earth formed about 4.6 billion years ago, it was a lifeless place. A billion years later it was teeming with organisms such as blue-green algae. How did life begin? The discovery of self-replicating RNA was a critical milestone on the road to life. Before the mid-17th century, most people believed that God had created humankind and other organisms by mud. For the next two centuries, those ideas were subjected to increasingly severe criticism.

In 1903, Svante Arrhenius proposed that life on the Earth was seeded by spores originating from another planet. In 1905, the astronomer Simon Newcomb proposed that because the Earth was a representative planet orbiting a representative star Sun, life could be abundant throughout the universe (Zubay, 2000). But up to now, there is no discovery of the life existing in another planet.

All living things consist of similar organic compounds. Proteins in all organisms are consisted by one set of 20 amino acids. These proteins include enzymes that are essential to live, develop and reproduce, and the protein that essential to the organism structure. Organisms carry their genetic information in nucleic acids RNA and DNA, and use them as the same genetic code. This code specifies the amino acid sequences of all the proteins and peptides in each organism. The nucleotides consist of a sugar (deoxyribose in DNA and ribose in RNA), a phosphate group and one of four different bases. In DNA, the bases are adenine (A), guanine (G), cytosine (C) and thymine (T). In RNA, uracil (U) substitutes for T. The bases constitute the alphabet, and triplets of bases form the words as the genetic codes. As an example, the triplet CUU in RNA instructs a cell to add the amino acid leucine to a growing strand of protein when the protein is synthesized. Organisms store genetic information in nucleic acids that specified the composition of all sythesized proteins. It relies on proteins to play the biological metabolism processes.

There is a paradox. Nowadays nucleic acids are synthesized only with the catalyzing of proteins, and proteins are synthesized only with the coding of nucleic acids. It is impossible that proteins and nucleic acids arose spontaneously in the same place at the same time. It is also impossible to have one without the other. And so, at first glance, one might have to conclude that life could never have originated by chemical means. In the fact, RNA came first and established what is now called the RNA world - a world in which RNA catalyzed all the reactions necessary for a precursor of life's last common ancestor to survive and replicate. RNA has developed the ability to code amino acids to synthesize proteins. The modern RNA viruses are still use RNA as their genetic codes. The ribonucleotides in RNA are more readily synthesized than are the deoxyribonucleotides in DNA. Moreover, DNA could evolve from RNA and then take over RNA's role as the heredity. In fact, RNA came before proteins. In 1983 Thomas Cech at University of Colorado and Sidney Altman at Yale University discovered the first known ribozymes, enzymes made of RNA. The first ribozymes identified could do little more than cut and join preexisting RNA. Nevertheless.

As the experiments to reveal the original origin of life in the Earth, in the early 1950s Stanley Miller, working in the laboratory of Harold C. Urey at the University of Chicago, did the first experiment to clarify the chemical reactions that occurred on the primitive earth. In the flask at the bottom, he heated water and forced water vapor to circulate through the apparatus. The flask at the top contained an atmosphere consisting of methane (CH4), ammonia (NH3), hydrogen (H2) and the circulating water vapor. Next he exposed the gases to a continuous electrical discharge, causing the gases to interact. Water soluble products of those reactions then passed through a condenser and dissolved in the mock ocean. The experiment yielded amino acids and enabled Miller to explain how they had formed. For instance, glycine appeared after reactions in the atmosphere produced simple compounds formaldehyde and hydrogen cyanide that participated in the set of reactions that took place. For the above experiments, one heavy critics is that the so called amino acid products coming from bacteria contamination. Bacteria exist everywhere in the Earth and it is very possible to get the bacterial contamination in the experiments.

Stem cell is the origin of an orgnism’s life. Stem cells have the remarkable potential to develop into many different cell types in life bodies, that are exciting to scientists because of their potential to develop into many different cells, tissues and organs. Stem cell is totipotent and it is a single cell that can give rise to progeny that differentiate into any of the specialized cells of embryonic or adult tissue. The ultimate stem cells (fertilized egg) divides to branches of cells that form various differentiated tissues or organs. During these early decisions, each daughter cell retains totipotency. Through divisions and differentiations the embryonic stem cells lose totipotency and gain differentiated function. During normal tissue renewal in adult organs, tissue stem cells give rise to progeny that differentiate into mature functioning cells of that tissue. Stem cells losing totipotentiality are progenitor cells. Except for germinal

cells, which retain totipotency, most stem cells in adult tissues have reduced potential to produce cells of different types (Ma, 2005c).

The Panspermia hypothesis proposes that life originated elsewhere in the universe and was subsequently transferred to Earth perhaps via meteorites, comets or cosmic dust. There are many different hypotheses regarding the path that might have been taken from simple organic molecules via pre-cellular life to protocells and metabolism. Many models fall into the "genes-first" category or the "metabolism-first" category, but a recent trend is the emergence of hybrid models that do not fit into either of these categories.

5. Nature of Life

As it was described in another paper "The nature of time and space": From the ontology (or naturalism) angle, time and space are absolute (existed) and the universe is a timeless world, which means that all the past, the present and the future exist eternally. Everything in the universe will never change. Time and motion are nothing more than illusions. In the universe, every moment of every individual's life - birth, death, and anything in between - exists forever. Everyone is eternal. That means each and every one of us is immortal. The universe has neither past nor future. All the things in the past, present, and future exist forever. The concepts of past, present and future are depended on the human brain" (Ma, 2003). Life is something (substance) existing in the timeless world. So that, all the life processes are the simple existence of something in the universe, like a movie in a tape – exist already and forever. This is the essential nature of life, in the ontology point. Under the timeless principle, there is only existence in the universe, not something complexity and other thing simplicity. The life is not more complex than non-life from the ontological concept. However, in the timeless world, there are natural connections among the all the existence. All the scientific studies, philosophical ratiocinations and religious believe are the trial to reveal the natural rules.

The second law of thermodynamics was formulated in the middle of the last century by Clausius and Thomson, which could be formulated in four different ways:

(1) Heat cannot flow from a colder body to a hotter one without energy input.

(2) Entropy must increase in a closed system.

(3) No cyclic process can convert heat entirely to work.

(4) In any cyclic process the heat Q transferred to the system from its surroundings at the temperature T must obey an inequality: $\oint dQ/T<0$ (Ma, 2003).

Above the four points, the principle concept of the second law of thermodynamics is to say that in the closed system all the natural processes increase entropy (decrease order). So, the second law of thermodynamics can be called the entropy law or law of entropy. However, life violates the second law of thermodynamics. In the natural world, the life process is negative entropy one. In the life process, the entropy decreases, which means that the order increases. More importantly, there is no evidence to say that the entropy decrease of life costs by the entropy increase of environment. The conclusion is that the life process does not obey the second law of thermodynamics. For all we know that all life phenomena obey to the entire natural laws that adapted to the non-life world. How can we say that life violates the second law of thermodynamics? Is there any conflict? The answer is that there is no conflict here. As it was described in the article "The nature of time and space", "the second law of thermodynamics is a statistical result, ……, the basic statistical principles and the second law of thermodynamics are useful tools in human practice, but they are not the true natural existence" (Ma, 2003). The fact is that the life process does not obey the second law of thermodynamics, but it obeys all the natural laws. The second law of thermodynamics is not a natural law, but a technical tool.

Autopoiesis is the process whereby an organization produces itself. An autopoietic organization is an autonomous and self-maintaining unity which contains component-producing processes. The components, through their interaction, generate recursively the same network of processes which produced them. An autopoietic system is operationally closed and structurally state determined with no apparent inputs and outputs. A cell and an organism is an autopoietic system. Autonomy is the condition of subordinating all changes to the maintenance of the organization. Self-asserting capacity of living systems maintain their identity through the active compensation of deformations. Allopoiesis is the process whereby an organization produces something other than the organization itself. An assembly line is an example of an allopoietic system (Varela, 2005). Life is an emergent property of autopoietic, dissipative systems. Life is an autopoiesis (auto-organizing) complex, which can organize itself without energy input, even without

information input. Active life process costs energy and uses information. However, the cost of energy is not the requirement of energy by the second law of thermodynamics. It cannot stay long period without energy and information input. After a while without exchange energy and information with outside world, the active life will die.

6. Evolution, Creation and Adaptation

Evolution theory is one of the most important theories in science. The evolution of life shows a remarkable growth in complexity. Simple prokaryotic one-celled life leads to more complex eukaryotic single-celled life, which then leads to multicellular life, then to large-bodied vertebrate creatures with sophisticated sensory processing capacities, and ultimately to highly intelligent creatures that use language and develop sophisticated technology as human. Creation theory is to say that the life is not evolution but created by God, and all the species do not change forever. The interest thing is that many scientists are strongly believe creation in their non-work time, which means that the scientists believe Bible when they are in their churches in their religious time (normally in the weekend) or when they spend time in their Bible studies. However, these scientists never do anything following creation theory in their work time, which means that they never do any experimental or publish any thing in the academic journals or teach students to support creation opinions. In the work time they need to do something that positive for their life as their income comes from the work, and non-work time they can do anything what they want.

Gene transfer is to transfer a gene from one DNA molecule to another DNA molecule, which can change the genetic background of an organism in anyway we want (Ma, 2005a). The evolution happens naturally, and also can happen artificially by gene transfer technique. Cloning creates a genetically identical copy of an animal or plant, which can be done in all the kinds of living things, including human being. Transgenic animal and clone for the study of gene regulation and expression has become commonplace in the modern biological science now (Pinkert, 1999). The sheep Dolly was the world's most famous clone animal, but it was not the first one. Many animals - including frogs, mice, sheep and cows had been cloned before Dolly. Plants have been often cloned since ancient people. Human identical twins are also clones. Dolly was the first mammal to be cloned from an adult cell, rather than an embryo. This was a major scientific achievement of Dolly, but also raised scientific and ethical concerns. Since Dolly was born in 1996, many other animals have been cloned from adult cells, such as mice, pigs, goats and cattle, etc. Cloning by interspecies nuclear transfer offers the possibility of keeping the genetic stock of those species on hand without maintaining populations in captivity (Lanza, 2002) and change the species, but also possibly creates the risk of biological calamity (Ma, 2004).

Adaptive evolutionary explanations are familiar to all of us from elementary school biology. A classic application of adaptationism is to explain the giraffe’s long neck as an adaptation for browsing among the tops of trees, on the grounds that natural selection favored longer-necked giraffes over their shorter-necked cousins. There are alternatives to adaptive explanations, such as explanations appealing to allometry, genetic drift, developmental constraints, genetic linkage, epistasis, and pleiotropy. The presupposition that a trait is an adaptation and so deserves an adaptive explanation is usually treated as unfalsifiable. The adaptationist perspective on evolution emphasizes natural selection’s role in creating the complex adaptive structures found in living systems. The important feature for all life is the evolutionary process of adaptation. For the evolution, it is sometimes the blind operation of natural selection, sometimes the general process of evolution, and sometimes the adaptation produced by the evolution. Normally the life should have the ability to adapt appropriately to unpredictable changes in the environment. It is the force of adaptation and selection that makes the evolution happens. The adaptation is supple.

Both living systems and artificial life models are commonly said to exhibit emergent phenomena. Emergent phenomena share two characterizations: they are constituted by and generated from underlying phenomena, and they are autonomous from those underlying phenomena. There are three main points for emergent properties. The first key point of emergence is simply the idea of a property that applies to wholes or totalities but does not apply to the component parts considered in isolation. The second key point of emergence is to insist that emergent properties are supervenient properties with causal powers that are irreducible to the causal powers of micro-level constituents. The third key point of emergence is poised midway between the other two.

7. Classification of Life

The hierarchy of scientific classification's major eight taxonomic ranks. Life is divided into domains, which are subdivided into further groups. Intermediate minor rankings are not shown. Traditionally, people have divided organisms into the classes of plants and animals, based mainly on their ability of movement. The first known attempt to classify organisms, as per personal observations, was conducted by the Greek philosopher Aristotle.

He classified all living organisms known at that time as either a plant or an animal. Aristotle distinguished animals with blood from animals without blood, which can be compared with the concepts of vertebrates and invertebrates respectively. He divided the blooded animals into five groups: viviparous quadrupeds, birds, oviparous quadrupeds, fishes and whales. The bloodless animals were also divided into five groups: cephalopods, crustaceans, insects, shelled animals and "zoophytes". Though Aristotle's work in zoology was not without errors, it was the grandest biological synthesis of the time, and remained the ultimate authority for many centuries after his death. His observations on the anatomy of octopus, cuttlefish, crustaceans, and many other marine invertebrates are remarkably accurate, and could only have been made from first-hand experience with dissection.

The exploration of parts of the New World produced large numbers of new plants and animals that needed descriptions and classification. The old systems made it difficult to study and locate all these new specimens within a collection and often the same plants or animals were given different names because the number of specimens were too large to memorize. A system was needed that could group these specimens together so they could be found, the binomial system was developed based on morphology with groups having similar appearances. In the latter part of the 16th century and the beginning of the 17th, careful study of animals commenced, which, directed first to familiar kinds, was gradually extended until it formed a sufficient body of knowledge to serve as an anatomical basis for classification.

The Fungi have long been a problematic group in the biological classification: Originally, they were treated as plants. For a short period Linnaeus had placed them in the taxon Vermes in Animalia because he was misinformed: the hyphae were said to have been worms. He later placed them back in Plantae. Copeland classified the Fungi in his Protoctista, thus partially avoiding the problem but acknowledging their special status. The problem was eventually solved by Whittaker, when he gave them their own kingdom in his five-kingdom system. As it turned out, the fungi are more closely related to animals than to plants.

As new discoveries enabled us to study cells and microorganisms, new groups of life where revealed, and the fields of cell biology and microbiology were created. These new organisms were originally described separately in Protozoa as animals and Protophyta/Thallophyta as plants, but were united by Haeckel in his kingdom Protista, later the group of prokaryotes were split of in the kingdom Monera, eventually this kingdom would be divided in two separate groups, the Bacteria and the Archaea, leading to the six-kingdom system and eventually to the three-domain system. The 'remaining' protists would later be divided into smaller groups in clades in relation to more complex organisms. Thomas Cavalier-Smith, who has published extensively on the classification of protists, has recently proposed that the Neomura, the clade which groups together the Archaea and Eukarya, would have evolved from Bacteria, more precisely from Actinobacteria.

As microbiology, molecular biology and virology developed, non-cellular reproducing agents were discovered, sometimes these are considered to be alive and are treated in the domain of non-cellular life named Acytota or Aphanobionta, which are virus. All the primary taxonomical ranks are established: Domain, Kingdom, Phylum, Class, Order, Family, Genus, Species. Since the 1960s a trend called cladistics has emerged, arranging taxa in an evolutionary or phylogenetic tree. If a taxon includes all the descendants of some ancestral form, it is called monophyletic, as opposed to paraphyletic, groups based on traits which have evolved separately and where the most recent common ancestor is not included are called polyphyletic. A new formal code of nomenclature, the PhyloCode, to be renamed International Code of Phylogenetic Nomenclature, is currently under development, intended to deal with clades, which do not have set ranks, unlike conventional Linnaean taxonomy. It is unclear, should this be implemented, how the different codes will coexist.

Living phenomena fall into a complex hierarchy of levels, what can be called the *vital hierarchy*. Even broad brush strokes can distinguish at least eight levels in the vital hierarchy:

(1) Ecosystems.
(2) Communities.
(3) Populations.
(4) Organisms.

(5) Organ systems (immune system, cardiovascular system).
(6) Organs (heart, kidney, spleen).
(7) Tissues.
(8) Cells.

Under the life hierarchy, there are molecules, atoms and quanta that are substance but not life constituents. Items at one level in the hierarchy constitute items at higher levels. Individual organisms are born, live for a while, and then die. The vital hierarchy raises two basic kinds of questions about the nature of life. First, we may ask whether there is some inherent tendency for living systems to form hierarchies. Why are hierarchies so prevalent in the phenomena of life? The second question concerns the relationships among the kinds of life exhibited throughout the vital hierarchy. Are there different forms of life at different levels, and if so then how are these related? How are they similar and different? Which are prior and which posterior? What is the primary form of life?

The theory supple adaptation reveals a two-tier structure with connected but different forms of life. The first tier is the primary form of life - the supplely adapting systems. At the second tier, entities that are suitably generated and sustained by such a supplely adapting system branch off as different but connected secondary forms of life. These secondary forms of life include organisms, organs, and cells.

8. Matter and Form of Life

The advent of the field of artificial life has focused attention on a set of questions about the role of matter and form in life. On the one hand, certain distinctive carbon-based macromolecules play a crucial role in the vital processes of all known living entities; on the other hand, life seems more like a kind of a process than a kind of substance. Furthermore, much of the practice of artificial life research seems to presuppose that life can be realized in a suitably programmed computer. This raises a number of related questions: Can a computer play all the functions of the organic life play? Is the natural life just substance properties what the substance has or life has independent proper that performs by the substance? Functionalism captures the truth about life. Furthermore, there is no evident reason why the functional structure specified the theory could not be realized in a suitably structured computational medium. If so, then a computerized “life” could in principle create a real, literally living entity. In fact, a computer can play many functions of the organic life play, but could not play all the functions of the organic life play, because the matter is essential different. The natural life is dependent on the substance of the life bodies.

According to the classic science, there are two independent existences in the world: matter and space. Matter occupies space and moves about in it and it is the primary reality. Space is a backdrop or container. Without furnished by material bodies, it does not enjoy reality in itself. This common sense concept goes back to the Greek materialists and it was the mainstay also of Newton's physics. It has been radically revised in Einstein's relativistic universe (where spacetime became an integrated four-dimensional manifold), and also in Bohr's and Heisenberg's quantum world. Now it may be considered that matter and space are unified. Advances in the new sciences suggest a further modification of this assumption about the nature of reality. In light of what scientists are beginning to glimpse regarding the nature of the quantum vacuum, the energy sea that underlies all of spacetime, it is no longer warranted to view matter as primary and space as secondary. In the modern concept there is no absolute matter, but only a matter generating energy field.

Could robot do all the things what human do? Could artificial electronic life play all the functions what the organic life play? Up to now, nobody can answer these questions. In 1966, John von Neumann made the first artificial life model with his famous creation of a self-reproducing, computation-universal entity using cellular automata. Von Neumann was pursuing many problems that are important in the artificial life today, such as understanding the spontaneous generation and evolution of complex adaptive structures. Originally, cybernetics applied two tools to the living system studies: the use of information theory and a deep study of the self-regulatory processes. Information theory typifies the abstractness and material-independence of artificial life, and self-regulation is one of the hallmarks of living systems studied in artificial life.

Biology studies have provided rich knowledge about actual living systems. Physics and mathematics have had a strong influence on artificial life, especially in the study of complex systems. Statistical mechanics and dynamical systems theory have improved artificial life’s methodology. The real artificial life should be organic life, same as the natural life. Right now, people can synthesize simple organic molecules such as sugar and amino acids from the inorganic carbon, hydrogen and oxygen. Just

after the technique developing, people will have the ability to make the real cells, tissues, organs and animals even a real human. This will be the real artificial life – everything is same as the natural life.

It is an essential philosophical question whether there is any intrinsic connection between life and mind. Viruses, plants, bacteria, worms, animals and human have various kinds of sensitivity to the environment, various ways in which this environmental sensitivity affects their behavior and various forms of inter-organism communication. Various kinds of what one could call mental capacities are present throughout the biosphere. Furthermore, the relative sophistication of these mental capacities seems to correspond to and explain the relative sophistication of those forms of life. It is reasonable to ask whether life and mind have some natural connection. The process of evolution establishes a genealogical connection between life and mind, but life and mind might be much more deeply unified. Since all forms of life must cope in one way or another with a complex, dynamic, and unpredictable world, perhaps this adaptive flexibility inseparably connects life and mind. In fact, the mind comes from brain that composes by the organic molecules and the organic molecules compose by inorganic matter. But, there is no evidence to say that the inorganic matter in the living organism is different from the inorganic matter out the living organism.

Up to now, no scientific evidence to show that life body and non-life body obey the different natural laws. By the classic physics and chemistry, there is no essential difference discovered in life and non-life. There is no lifeline defined by modern science, this means that we neither qualitate nor quantitate life by any current scientific method. However, all the researches are made by the methods of biology, biochemistry and molecular biology, etc., which means that all current biological and neurobiological descriptions of the life and brain are based on Newton's physics, even if it is well known that Newton's physics has its limitations. Biophysics has started for several decades and it did not get many achievements. Up to now, nobody tried to reveal the nature of life under the quantum level. It is reasonable to think about that the life and non-life are essential different in the biophysics, i.e. the quantum level. The life phenomenon, especially consciousness, is unlikely to arise from classical properties of matter. Quantum theory allows for a new concept of matter altogether, which may well leave cracks for life and consciousness, for something that is not purely material or purely extra-material. Interactions with the quantum vacuum may not be limited to micro-particles: they may also involve macroscale entities, such as living systems. The recognition of openness is returning to the natural sciences. Traffic between our consciousness and the rest of the world may be constant and flowing in both directions. Everything that goes on in our mind could leave its wave traces in the quantum vacuum, and everything could be received by those who know how to tune in to the subtle patterns that propagate there.

All the life organisms compose by organic molecules plus their inner environment such as inorganic water and ions (and specific fields) inside and outside the cells. The whole life world finally composes by an organic world, and even though all organic molecules compose by inorganic substance. But, nobody knows if the water in alive cells and around cells is same or different from the water far away from the cells (under the living meaning). It is possible that the inorganic environment of living cell is different from non-living environment in the quantum level. This is the principle task for biophysics doing to reveal the nature of life.

9. Apoptosis of Life

For all the things existed, including the life cells in the earth and universe itself, there is a time to live and a time to die. There are two ways in which cells die:

(1) Cells are killed by injury or disease.

(2) Cells suicide. Programmed cell death is also called apoptosis, which is cell suicide. Apoptosis is a mechanism by which cells undergo death to control cell proliferation or in response to DNA damage. Some types of cancers, such as B-cell chronic lymphocytic leukemia, follicular lymphoma (Tsujimoto, 1985) and tumors infected by human T-cell leukemia/lymphoma virus-1 (Hengartner, 2000) are characterized by defects in apoptosis leading to immortal clones of cells. Other malignancies have defects in the apoptotic regulatory pathways such as p53 (Kaufmann, 2001).

Apoptosis can be triggered by the following internal signals:

(1) In a healthy cell, the outer membranes of its mitochondria express the protein Bcl-2 on their surface.

(2) Bcl-2 is bound to a molecule of the protein Apaf-1.

(3) Internal damage to the cell (e.g., from reactive oxygen species) causes: Bcl-2 to release Apaf-1; a related protein, Bax, to penetrate mitochondrial membranes, causing; cytochrome c to leak out.

(4) The released cytochrome c and Apaf-1 bind to molecules of caspase-9.

(5) The resulting complex of cytochrome c, Apaf-1, caspase-9 and ATP is called the apoptosome.

(6) These aggregate in the cytosol.

(7) Caspase-9 is one of a family of over a dozen caspases. They are all proteases. They get their name because they cleave proteins — mostly each other — at aspartic acid (Asp) residues.

(8) Caspase-9 cleaves and activates other caspases.

(9) The sequential activation of one caspase by another creates an expanding cascade of proteolytic activity, which leads to digestion of structural proteins in the cytoplasm, degradation of chromosomal DNA, and phagocytosis of the cell.

Apoptosis can be triggered by external signals also:

(1) Fas and the TNF receptor are integral membrane proteins with their receptor domains exposed at the surface of the cell.

(2) Binding of the complementary death activator (FasL and TNF respectively) transmits a signal to the cytoplasm that leads to activation of caspase 8.

(3) When cytotoxic T cells recognize their target, they produce more FasL at their surface. This binds with Fas on surface of the target cell leading to its death by apoptosis.

Apoptosis is a universal event in the universe, that happens in all the life bodies and azoic things in the universe, including the universe itself. To understand apoptosis clearly will be important to the understand of the basic nature laws (Ma, 2005b). Apoptosis is the nature of life, and apoptosis is also the nature of nature!

10. Immortality of Life and Turritopsis nutricula

Can things be more or less alive? Serious reflection about life quickly raises the question whether life is a boolean property (zero or one) - whether it is a continuum property. We can say that a rat is alive and a rock is not alive. But it is difficult to say some condition of living body is alive or not, such as a virus which is unable to replicate without a host and spores or a frozen cell which remain dormant and unchanging indefinitely but then come back to life when conditions become suitable. Furthermore, we all agree that the original life forms somehow emerged from a pre-biotic chemical soup, and this suggests that there is very little, if any, principled distinction between life and non-life. In fact, life is continuum and it can be more or less alive. There is no absolute line between life and non-life. If life is considered as supple adaptation the most important life/non-life distinction involves a continuum because the activity of supple adaptability comes in degrees.

Turritopsis nutricula is a hydrozoan that can revert to the sexually immature (polyp stage) after becoming sexually mature. It is the only known metazoan capable of reverting completely to a sexually immature, colonial stage after having reached sexual maturity as a solitary stage. It does this through the cell development process of transdifferentiation. This cycle can repeat indefinitely tha offers it biologically immortal. Upto now, there is little academic report in the Turristopsis nutricula studies. To study the reason of the biological immortality of Turritopsis nutricula possibly supplies the way finding the biological immortality for human.

Turritopsis nutricula is a species of jellyfish with a very unusual quality: it is biologically immortal. Also known as the “Immortal Jellyfish,” this fascinating animal, in theory, has the ability to sustain life indefinitely, so long as its nerve center remains intact.

Typically, jellyfish die after reproducing, but the Immortal Jellyfish is capable of returning to a polyp after producing offspring. This essentially means that this type of jellyfish is able to return itself to a much younger state. As a result of reversing its life cycle, the Immortal Jellyfish can evade death. If the jellyfish continues to reverse its life cycle following reproduction, it can live on for an indefinite period. In laboratory tests, the species reverted back to the immature polyp stage 100% of the time.

Turritopsis nutricula is capable of rejuvenating itself due to a process called transdifferentiation. Transdifferentiation occurs when a non-stem cell turns itself into another type of cell. For example, in salamanders it has been observed that if the lens of the eye is removed, iris cells can transform themselves into lens cells. Transdifferentiation is rare, and when it does occur, it most commonly occurs in parts of the organsism, like in the eye of the salamander. However, the Immortal Jellyfish has incorporated transdifferentiation into its lifecycle. In the process, all of the old cells are regenerated. At the end of the cycle, the Immortal Jellyfish is a young polyp, ready to start life anew (Wendy, 2009).

While colonial animals can have their immortality, solitary individuals are doomed to die. Hydrozoan cnidarians usually have a complex life cycle, wherein a colonial stage leads to the sexually mature, solitary, adult stage. Eggs and sperms from solitary, sexual, adult medusa (jellyfish) develop into an embryo and planula larva, and they then form the colonial polyp stage. Medusae are formed asexually from polyps. These medusae have a limited lifespan and die shortly after releasing their gametes.

The hydrozoan Turritopsis nutricula has evolved a remarkable variation on this theme, and in so doing appears to have achieved immortality. The solitary medusa of this species can revert to its polyp stage after becoming sexually mature (Bavestrello et al., 1992; Piraino et al., 1996). In the laboratory, 100% of these medusae regularly undergo this change. Thus, it is possible that organismic death does not occur in this species!

The cells that accomplish the building of a new stolon are probably those of the exumbrella (the upper portion of the jellyfish dome). Transformation into stolons only occurs in fragments that contain tissues of the exumbrella and the ring canals, and the exumbrella tissue is the only tissue of the medusa that can transdifferentiate into the perisarc-secreting epidermal tissue of the stolons. The endoderm of the ring canals probably becomes the endoderm of the stolon and polyps. It is not known whether the sensory cells, myoepithelial cells, and cnidocytes are derived from the exumbrella or the endodermal component.

Everything in earthly existence, including human life, is involved in a process of ongoing change. Hence, permanence seems unattainable, and thereby especially desirable. The wish for immortality thus becomes one of the most important original reasons for the appearance of religions, and the motives of many scientific research fields can also be traced to this motive. Since very ancient times humans have wondered if after their deaths in this world they might continue to exist forever in some next and unchanging condition (Edmondson, 2005).

11. Discussions

There are plenty of puzzles about the concept of life. The concrete objects ready to hand are usually easily classified as living or non-living. Fish and ants are alive while candles, crystals and clouds are not. Yet many things are genuinely puzzling to classify as living or not. Viruses are one borderline case, biochemical soups of evolving RNA strings in molecular genetics laboratories are another. Extraterrestrial life forms, if any exist, might well not depend on DNA-encoded information or, indeed, any familiar carbon chemistry processes. How would we recognize extraterrestrial life if we found it? We have no reason to suppose it will have any of the accidental characteristics found in familiar forms of life. What, then, are the essential properties possessed by all possible forms of life? The search for extraterrestrial life needs some answer to this question, for we can search for life only if we have a prior conception of what life is.

The phenomena of life raise a variety of subtle and controversial questions. Early life forms somehow originated from pre-biotic chemical soup. Does this imply that there is an ineliminable continuum of things being more or less alive, as many suppose? Another subtle question concerns the different levels of living phenomena, such as cells, organs, organisms, ecosystems and asks in what senses the concept of life applies at these various levels. Does the essence of life concern matter or form? On the one hand, certain distinctive carbon-based macromolecules play a crucial role in the vital processes of all known living entities; on the other hand, life seems to be more in the nature of a process than a kind of substance. The relationship between life and mind raises another question. When we consider plants, bacteria, insects, and mammals, for example, we apparently find different kinds of mental activity, and it seems that different degrees of behavioral sophistication correspond to different levels of intelligence. Might the various forms of life and mind be somehow connected? To answer questions like these above and make sense of the puzzling phenomena of life, we need a sound and compelling grasp of the nature of life. Can any property embrace and unify not only life's existing diversity but also all its possible forms? What is the philosophically and scientifically most plausible way to account for the characteristic life-like features of

this striking diversity of phenomena? How can we resolve the controversies about life? The concept of life as supple adaptation, explained below, is my attempt to address these issues.

Notice that our ordinary, everyday concept of life does not settle what the true nature of life is. Thus, we are not concerned here with careful delineation of the paradigms and stereotypes that we commonly associate with life. We want to know what life is, not what people think life is. Glass does not fall under the everyday concept of a liquid, even though chemists tell us that glass really is a liquid. Likewise, we should not object if the true nature of life happens to have some initially counterintuitive consequences.

Four questions are important to answer:
(1) How are different forms of life at different levels of the vital hierarchy related?
(2) Is there a continuum between life and non-life?
(3) Does life essentially concern a living entity's material composition or its form?
(4) Are life and mind intrinsically connected?

For now, many people, including biologists and other scientists still believe that God created the life, even they never publish any academic articles to describe that. The ridiculous things are that many biologists always write articles and teach students evolution in their work time but believe creation theory (deny evolution) in their weekend church time. Depending on the academic articles, they make their career and life, but depending on the Bible, they come back non-experiment believe. The fighting between science and religion is still a heavy topic in the modern time.

Absolutely to say, there is no real line between life and non-life. Life can live forever, and the die is not absolutely necessary.

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无为而治应该是当今世界的管理主导

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摘要：面对目前美国在世界的一极统治、面对中国的社会状况、面对横扫世界的经济危机，世界与国家的管理理念上应该以甚么为主导呢？我的回答是无为而治应该是国家政治与世界政治的主导理念。无为而治就是所说的小政府大社会，就是在相对意义下政府做的越少越好，尽大可能的让全社会每一个人发挥自己的主观能动性，尽可能发挥每一个人的最大限度的力量。[Academia Arena, 2009;1(2):85-87]. ISSN 1553-992X.

关键词：一极统治；社会；世界；国家；无为而治；政治

面对目前美国在世界的一极统治、面对中国的社会状况、面对横扫世界的经济危机，世界与国家的管理理念上应该以甚么为主导呢？我的回答是无为而治应该是国家政治与世界政治的主导理念。

什麽是我们要的无为而治呢？其实这就是所说的小政府大社会，就是在相对意义下政府做的越少越好，尽大可能的让全社会每一个人发挥自己的主观能动性，尽可能发挥每一个人的最大限度的力量。具体的就是从联合国到中国政府或美国政府、到省地县乡村各级政府，其真正的天职是保持社会基本的稳定和秩序，让社会中每一个人都遵纪守法并最大程度的进行生产与幸福生活，而不是政府官员去奔忙于救市、引资或决定产品方向，政府军警有职责维持社会治安与国家不受侵犯，而不是派兵境外去寻求身外利益。这就是现代意义上的无为而治（百度百科，2009）。

这一点上，中国在经济上自改革开放以来的三十年中，在全世界做的较好，至少比美国欧州好。首先，中国在寻求与其它国家的商品交易经济往来中，是让人们尽可能有效的低成本生产，以自己的产品达到价廉物美而使他国人民以自己的经济利益为需要而购买，中国以此来实现自己的产品出口，而不是以狡猾地制定所谓金融包装或金融游戏规则或一些不平等的贸易规则。中国产品价廉物美的产生，也是中国产品生产中每个劳动者通过劳动生产出价廉物品的结果，而绝不是中国天才的金融精英或英明的国家领导金融运作的结果。中国这个无为而治的经济管理，决定了中国的高速增长与巨额顺差。在美国呢？即使拥有超过中国数个年代的技术与资产优势及资源优势，但是这 30 年来，总企图以“英明”的政府高官为主导，以“天才”的华尔街精英及经济学教授为带领，将大部分社会精力投入到金融产品运作、将本来就产生于自然存在于自然的地产等人为升高价格作为社会财富增多的重要努力方向，在国外则不惜每月上百亿的支出大举进行军事行动，耗掉大量财富，在国内严加管制，使经济生产成本升高，失去竞争力。

美国的国内经济管理，很多地方就没有中国管理灵活，太不无为而治。比如，在中国，大街小巷、学校工厂周围、旅游点等，在中国小商小贩就比美国多的多。中国的小商小贩，即能给更多的人挣钱谋生的就业机会，也方便了每个人，可以就近就地买到东西。同时，商贩多了，就会价格竞争，从而降低人们生活成本。再比如，在美国很多街上，即使街宽人不多，但商店物品不能放出门外，否则立即会有警察上前按规定制止或罚款。这些街道本来就街宽人少，商店放点商品在门外不影响甚么，但方便人们购物，扩大商店销售，但在美国这个大政府下，就比中国管的死。再举个例子：在美国这个大政府规定商业营业场所不能住人，而且几乎一刀切的死硬管理。我有个朋友开个小店，店内有个很不错的小房间。但是他想在小房间支张床（即使是钢丝创），也是绝对不可以的。这样他必须另外租房，还要每天花费 3 小时时间在来回的路上，外加交通费。这就管的太死了。小店里面有足够的地方，为什麽就不能睡个觉？为什麽一定要浪费时间和钱财，增加成本？所以，美国的社会活力小，效率低成本高，产出的东西价高物差，全世界人都不想购买，这样就造成美国一下子经济巨额亏空，造成天文数字的国内外欠债十多万亿甚至几十万亿，陷入经济衰退。

当然，所有的事情都有其质量度。政府运作太严苛就应该向无为而治方向移动，政府管理太松就应该加强管理，无政府主义也是绝对不可行的。比如，总不能放纵商家为了多卖钱而向奶粉里加毒物。现在美国的情况是管的太严苛了，中国也可以再无为而治一些。政府进一步无为而治，这才是发挥全社会所有人主观能动性、降低社会运转成本、增加社会财富积累、促进社会发展及避免危机的关键所在（新浪教育，2009）。

作为一种哲学思想,无为而治的思想渊源是战国时期的思想流派黄老道家，是积极入世，不同于庄子道家的消极避世，是把无为-顺善自然的思想与社会实际相结合，同时吸收了儒家和道家的思想，融合而成。

老子说：“道常无为而无不为，侯王若能守之，万物将自化”。道按照道来做，那就是无为，无为才能无所不为。作为领导者、管理者，要以无为而治的原则，这样万物自我化育，万物自我运行，得其发展。

老子还说“我无为而民自化，我好静而民自正，我无事而民自富，我无欲而民自朴”。就是说管理国家的人，只要能做到无为，就会使老百姓自我化育，该休息休息，该种地种地，该娱乐的娱乐，该做什么做什么。自我生产，自我繁殖，自我休养生息；所谓我好静，就是说不要老是今天想做这件事情，明天想做那件事情，总在老百姓所要求的之外，在老百姓的生活之外，老想再附加做一些事情。用不着，你好静，老百姓自我端正，用不着你去纠正老百姓，你别怕老百姓不端正，用不着你去端正，你只要静止在那儿，老百姓自己就端正了；所谓我无事而民自富，就是说在老百姓的生活之外，你不用再更多地要求做其它的事情，老百姓自己就能够恢复经济，自己就能富裕起来：所谓我无欲而民自朴，就是说你没有欲望老百姓就朴实，你欲望越多，那么老百姓就不朴实了，他就越来越要想方设法对付那些额外的东西。

老子还说：“圣人常无心，以百姓心为心”。就是说，圣人不要在百姓的想法之外再有什么其它跟他们不一样的想法，你的想法应该跟，跟普通社会成员之间的想法应该是一致的。
尽量发挥人民自主力量发展生产。宰相曹参本人整天在家里饮酒作乐，无所事事，并重用那些比较粗心、和缓、大而化之，但宽宏大量、不斤斤计较、不苛刻的人，是全社会每个人都得到机会以自己的意愿与想法进行生产创造，使每个人的能力与资源得到利用，而不是由帝王官员或才子佳人来严格的指挥百姓去工作生活。

为了对无为而治对社会的作用有更具体的认识，我们比较汉初前后的强权社会。汉初之前，人才辈出，治国理论与青史留名的天才人物及其业绩也让后人为之惊叹。但这些英才用他们的“智慧”指导亿万“愚民”的结果呢？请看：

春秋战国时代到秦末汉初，那时精英充斥，人才辈出（孔子、孙子、白起、庞涓、齐桓公、秦嬴政等，举不胜举），但结果是生产停滞、民不聊生、战争持久残酷。从春秋战国，到秦，到秦末，到楚汉相争，中国始终就没有安定过，大量的土地荒芜，社会经济非常残破，人民的生活非常贫困，整个社会包括那些贵族、功臣甚至皇帝的生活也都不富裕。据说当时的很多将相、将军、大臣出门都没有马车，只得坐牛车。比如长平之战，秦国消灭了赵国的主力并一次就杀死 45 万赵国官兵，白起消灭了韩魏联军 150 多万。整个社会和老百姓为战争付出巨大。最后经过战国后期，秦国统一全国。然而，统一后秦始皇强权统治，苛捐杂税加剧，法度苛严，并大量地调用民力，修筑长城、石道、骊山陵，同时还调兵攻打匈奴，人们生活在惊恐与贫穷之中，物质与精神上紧张严峻。所以统一后老百姓没有得到休养生息。秦朝的暴政很快激起了人民的反抗，发生了秦末农民大起义。刘邦与项羽把秦朝推翻以后，继续战争，争夺统治权，这场个楚汉相争又打了五年，结果又使一大批的人流离失所。

到了汉初，由汉惠帝即位后宰相曹参采用无为而治的国家管理方式，延续 70 年，结果是甚么呢？是经济与社会的复苏和发展。随着经济的发展，整个社会生机勃勃。这个发展由汉朝初期的建立，到后来汉武帝，大概经历了七十年左右，一直采取无为而治的方式。经济发展到什么程度呢？据史书记载：国家的粮食多的粮仓全都满了，有很多地方粮仓里粮食都腐烂了，同时国库里存了大量的钱，以至于串钱的绳子都烂了。人民生活也丰衣足食。老百姓能吃饱饭了，衣服也穿得比较华丽。可谓国富民强。

西汉，刘邦和萧何死了以后，汉惠帝即位，宰相曹参。在治理国家的指导思想与个人风格方面，曹参，大事小作，在用人方面，他重用那些粗心不苛察的人。曹参的用这些无为而治的思想有效地治理了国家，使人民休养生息，社会发展。汉初的无为从汉惠帝曹参开始，然后是汉文帝、汉景帝以及汉武帝统治的前一段时间。具体做法有：

1. 尽量发挥人民自主力量发展生产。宰相曹参本人整天在家里饮酒作乐，无所事事，并重用那些比较粗心、和缓、大而化之，但宽宏大量、不斤斤计较、不苛刻的人，是全社会每个人都得到机会以自己的意愿与想法进行生产创造，使每个人的能力与资源得到利用，而不是由帝王官员或才子佳人来严格的指挥百姓去工作生活。

2. 轻徭薄赋。从汉惠帝开始，将对农民的税率负担从原来的 10% 降到 6%。到汉文帝时期免除了一切税赋 12 年。汉景帝时又把税率减成 3%。在徭役上，尽量少使用老百姓，尽量少调发徭役。同时，皇帝官员也艰苦朴素。

3. 宽刑轻狱。从汉高祖，就废除了秦朝的许多严刑峻法，到汉文帝继续废除了一些酷刑，取消了连座和灭族的刑罚，对于有些按原来法律可以判死刑的则进行了改判，给人一条生路。这种做法对于缓和社会矛盾起到了有效的作用。

4. 实行仁政。汉文帝采取仁慈宽厚的政策，以德报怨，缓和了中央与地方及政府与人民的关系。

5. 和平减少战争。比如汉初在对待匈奴的态度上采取了无为而治。无为而治并不是不反抗，而是反击保持一定的限度，就是说把匈奴打跑就行了，不深入到匈奴的腹地，能够解除边患就可以了。

汉初 70 年后，从汉武帝开始，由于皇权的强化，由开始有为而治，包括武帝的政府及王莽的新政。结果呢？最终造成社会混乱、三国多国、隋唐之争，民不聊生。

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Inaction Management on the Current World

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