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Giving thanks to all of Editorial Managing and Editorial Boards/Referees as we prepared for the welcome to our 2013 editing and staff, this marks the last issues for 43 staff Members. We will return for Autumn issues in September with the new historical researches and reviews in publishing.

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The Roots of the Theoretical Models of the Nanotechnoscience in the Electric Circuit Theory

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In the contemporary nanotechnoscience makes natural-scientific experimentation constitutive for design, while research results are oriented equally on interpreting and predicting the course of natural processes, and on designing devices. Nanoystems can be seen as nanoelectrical switches in a nanocircuit. In nanocircuit structure, we find traditional electronic components at different levels, realized on the basis of nanotechnology. In nanotechnoscience explanatory models of natural phenomena are proposed, and predictions of the course of certain natural events on the basis of mathematics and experimental data are formulated, on the one hand, as in classical natural science; as in the engineering sciences, on the other hand, not only experimental setups, but also structural plans for new nanosystems previously unknown in nature and technology are devised. In nanotechnoscience different models (equivalent circuits with standard electronic components) of electric circuit theory are used for the analysis and synthesis of nanocircuits, and a special nanocircuit theory is elaborated. So nanotechnology is, at the same time, a field of scientific knowledge and a sphere of engineering activity—in other words, NanoTechnoScience, similar to Systems Engineering as the analysis and design of complex micro- and nanosystems.

Keywords: History of Science; History of Engineering Science; Nanotechnoscience; Electric Circuits Theory; Electronic Nanocircuit; Circuits Models of Nanosystems; Natural Science; Engineering Science; Science and Engineering

Introduction

Contemporary technoscience makes natural scientific experimentation inseparable from design, while research results are equally oriented to interpret and predict the course of natural processes and to design structures.

Engineering theory is oriented not toward interpreting and predicting the course of natural processes but toward designing engineering schemes. Natural scientific knowledge and laws must be considerably specified and modified in engineering theory to be applicable to practical engineering problems. To adapt theoretical knowledge to the level of practical engineering recommendations, technical theory develops special rules that establish a correspondence between the abstract objects of engineering theory and the structural components of real engineering systems and operations that transfer theoretical results into engineering practice. Engineering sciences are specific because their engineering practice replaces experiments, as a rule. It is engineering activity that checks the adequacy of theoretical engineering conclusions and serves as a source of new empirical knowledge.

In the nanotechnoscience is equal important the explanation and prognostication of the course natural processes (like in natural science) and multiplying of structural schemes of nanosystems (like in engineering science). Electron beam lithography system is at the same time experimental investigation system and is used for the nanofabrication as so-called "nanowriter".

It is well-known that, in nanotechnoscience, constructs from various scientific theories—classical and quantum physics, classical and quantum chemistry, structural biology, etc.—are used, whereas, in nanosystems, different physical, chemical and biological processes take place. However one can also construct the circuit on the basis of definite nanosructures, such as, e.g., a super-heterodyne radio receiver on the nanolevel (see: Bhushan 2004: p. 240).

In the nanotechnoscience for analysis and synthesis of the nanocircuits also are used the different models (equivalent circuits with standard electronics components) of the electric circuit theory and is elaborated a special nanocircuit theory. In the structure of the nanocircuits we can find many different traditional electronic components ("molecular-scale electronics") realized on the nanolevel with the help of nanotechnology: first, there are electronic elements, second, electronics blocks, and third, large-scale nanosystems.

The Structure of NanoTechnoScience

In nanotechnoscience, on the one hand, explanatory models of natural phenomena are drawn up and predictions of the

course of certain natural events on the basis of mathematics and experimental data are formulated as in classical natural science, and, as in the engineering sciences on the other hand, not only experimental arrangements are constructed, but also structural plans of new nanosystems previously unknown in nature and technology (**Figure 1**).

Three main levels in the theoretical (ontological) schemes of a nano scientific theory can be discerned, namely mathematically oriented functional schemes, "flow" schemes reflecting natural processes going in the investigated or constructed system, and structural schemes representing its structural parameters and engineering analysis, i.e. systems structure.

The *functional scheme* is oriented on the mathematical description and fixes the general idea about the system (for example, nanosystem), irrespective of the method of its realization. The units of this scheme reflect only the functional properties of the elements of the system for the sake of which they are included in it to attain the general objective and reflect certain mathematical relations. The blocks of this scheme reflect only those functional properties of the systems elements, for which they are incorporated and which contribute to achieving the common purpose. The blocks express generalized mathematical operations and their relations are particular mathematical dependences. But they can be expressed as a simple decomposition of interrelated functions aimed at achieving the customer-prescribed common purpose of system under investigation and/or design. Such a functional scheme is used to construct a system algorithm and determine a system configuration.

Flow schemes (for example, flow block diagram) describe natural, for instance, physical processes taking place in the technical system and connecting its elements into a single whole. The units of such schemes reflect various operations performed in the natural process by the elements of the technical system while it is functioning. These are based on natural-scientific concepts first of all physical processes.

In the nanotechnology they present not only physical (electrical, mechanical, hydraulic, etc.) processes, but also chemical and biological ones, that is to say any natural processes in general. The blocks of these schemes reflect various operations performed by the elements of the nanotechnological system during its function. In the extreme general terms, "flow" schemes represent not only natural processes, but also any flow of "substance" (matter, energy or information).

Structural schemes reflect the structural arrangement of elements and linkages in the given system and presuppose its possible realization. They are the theoretical drafts of the systems structure to elaborate a project of the experimental situation together with the experimental equipment. Hertz for example developed structural schemes and a conceptual apparatus corresponding to them—such concepts as the dipole and vibrator. The scrupulous description of test equipment designs (e.g., of mirror material, shape and dimensions, etc.) was combined with the general description of experimental measurement situations, the latter being a prototype of future electric circuits of the radio receiver and radio transmitter. In the nanotechnology can be another realization as in the traditional electronics but the structural scheme is similar. For example, the one of the main elements of electric circuits—capacitor can receive in nantotechnology another construction as conventional Faraday capacitor but has the similar representation as two-terminal network-capacitive resistance.

The structural scheme gives nodal points of "flows" (operating processes) which can be equipment items, parts of or even entire complicated systems. The elements of the latter are regarded in them as having not only functional properties, but also properties of the second order, i.e. those undesirable properties which are added by a definitely realized element, for instance, non-linear distortions of the amplified signal in the

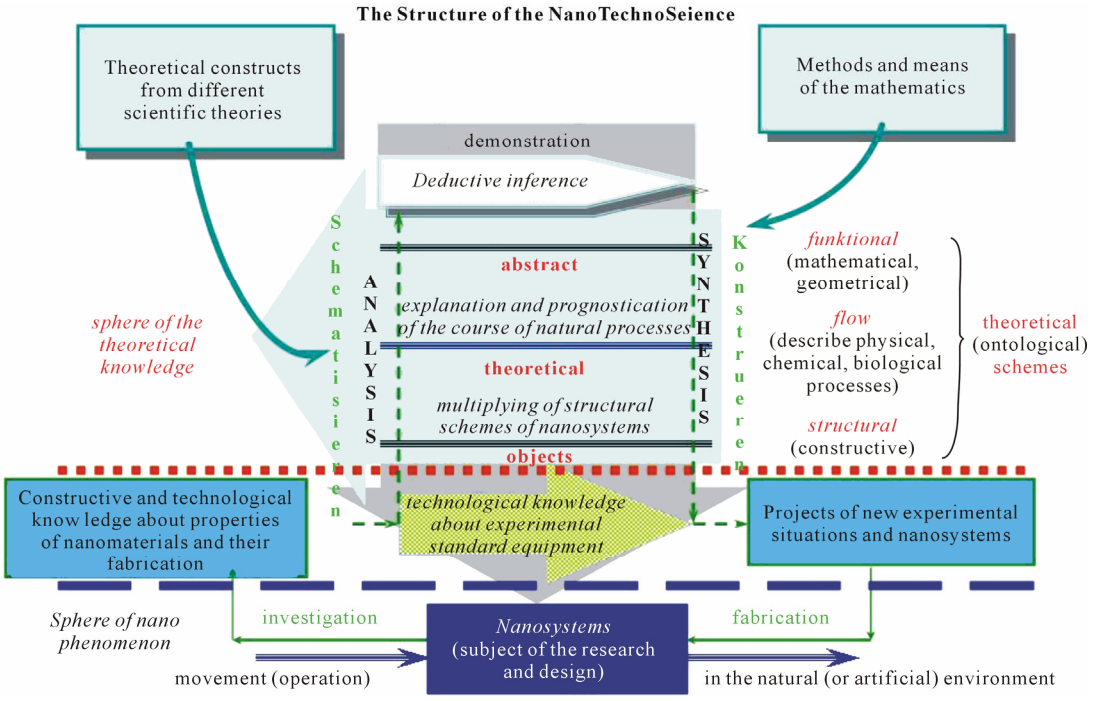


Figure 1.
The structure of NanoTecnoScience.

amplifier. These schemes represent constructive-technical and technological parameters, i.e. they reflect specific problems cropping up in engineering practice. In modern man-machine and nanobio hybrid systems, such a realization can be of diverse types and even be a non-engineering and non-physical one. Therefore, the terms "technical parameters", "construction" are not apt here. The case in point is the configuration of systems, their general structure.

From the radio electronics point of view it makes no difference what kind of the realization has the circuit (also as nanostructure). His blocs and elements can be represented in all cases as the correspondent equivalent circuits with standard electronics components.

Let us consider the specific features of the above-mentioned theoretical schemes of engineering science, referring to the electric circuit theory.

Even structural schemes of electric engineering are idealizations of real electric circuits. They omit many of particular characteristics of an electrical device, such as its overall dimensions, weight, assembly techniques, etc. (they are specified during design work and manufacture, i.e. during engineering itself). Such schemes give general structural and technical, and manufacturing parameters of standardized structural elements (resistors, inductance coils, batteries, etc.), which will be used in further analysis, namely, their types and dimensions taken from catalogues, operating voltage, the best arrangements and connection types, screening. In the electric circuit theory, such schemes are initial ones. They are taken in the ready-to-use form from other, more special electric engineering disciplines are subjected to theoretical analysis.

One should differentiate between the structural theoretical scheme and various types of real engineering schemes (e.g., wiring diagrams). Principal elements of the structural scheme are a power source, load (electric power receiver) and idealized structural elements, connecting them and represented by special symbols. Numerous parameters of real structural elements are omitted.

The "flow" scheme of the electric circuit theory reflects an electromagnetic process going in a functioning electric device and the circuit itself is a set of elements and their relations (connections), forming a current path. The latter has the following parameters: voltage, strength, power, amplitude, phase and frequency (for sinusoidal current). In addition, there exist various kinds of this process (and their respective modes of circuit function): direct and alternating, periodical and non-periodic, steady-state and transient currents, etc. Current transformation is either the quantitative transformation of its parameters (for example, current strength and voltage) or the transformation of the pattern of its variation in time (say, of direct current into alternating current or vice versa). Resistance, inductance, capacitance, which are further idealizations of the corresponding structural elements of the electric circuit (the resistor, inductor, capacitor), and ideal current and voltage sources can be considered as "flow" scheme elements. This "semiotic constructor" makes it possible to represent any structural element of the structural scheme.

To each element of the "flow" scheme there corresponds a specific physical process whose detailed description is beyond the scope of the electric circuit theory which takes it into account, however. (For example, resistance represents irrecoverable losses of electric energy in the circuit, resulting from its transformation into other forms of energy-thermal, chemical, etc.) In the electric circuit theory, this process is expressed by a definite relationship of physical parameters of an element, say, voltage versus current strength or electric charge versus voltage, and the number of appropriate units of measurement (ohm, farad, hertz, etc.) Electric circuit elements form branches which are joined by means of ideal electric connections (i.e. connections free of resistance, inductance, capacitance) to form nodes and loops.

Similar in nanotechnology nanoinsulators and nanoconnectors for optical nanocircuits may be considered to be complex circuit elements, C_1, C_2 and L (see **Figure 2**): "it is possible to characterize complex arrangements of (plasmonic and non-plasmonic) optical nanocircuit elements using the circuit theory" (Silveirinha, Alù, Li, & Engheta, 2007: p. 64).

Distributed-parameter circuits ("A distributed parameter is a

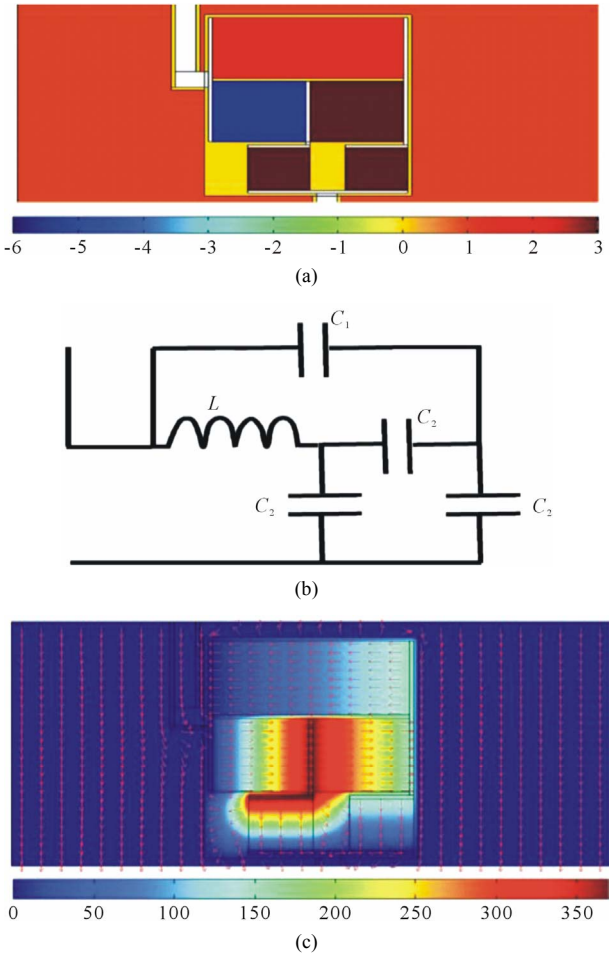


Figure 2.
(a) An optical nanocircuit formed by five nanomodules (four nanocapacitors and one nanoinductor), mimicking the function of the circuit shown in (b). Here a 2D configuration is considered. The value of the permittivity for each nanomodule is shown in the color scale in (a). The white region represents a material with a high permittivity (EVL). (c) Two-dimensional (2D) finite element method (FEM) "quasi-static" simulation of optical nanocircuit in (a). Here the color scheme shows the optical potential distributions, and the arrows shows the direction (not the amplitude) of displacement current in each nanomodule. We note how high the value of optical potential reaches in some of the nodes of this nanocircuit, due to the LC resonance (Silveirinha, Alù, Li, & Engheta, 2007: p. 63).

parameter which is spread throughout a structure and is not confined to a lumped element such as a coil of wire" (Wilson, 2007), e.g., homogeneous lines, are theoretically presented for engineering analysis as distributed-parameter circuits equiva1ent to them under given operating conditions (e.g., in a particular frequency band). The distributed-parameter circuit can be analyzed within the framework of the electric circuit theory and with the use of the electromagnetic field theory. Moreover, the flow scheme of substitution, derived within the framework of the electric circuit theory can be represented by different functional schemes (e.g., the potential diagram or two-ports). Similar in the nanotechnoscience can be described the geometry of two-nanotube transmission line and his RF circuit model (Burke, 2004: p. 3).

Functional schemes of the electric circuit theory are diagrams, graphical forms of the mathematical description of the electric circuit state, To each functional element of this diagram there corresponds a particular mathematical relationship, say, current strength versus voltage in some circuit section, or a particular mathematical operation (say, differentiation or integration). The arrangement and characteristics of functional elements correspond to the flow circuit scheme. Thus, in the circuit analysis, say, with the aid of the graph theory, circuit flow scheme elements (inductances, capacitances, resistances, etc.) are substituted, in accordance with definite rules, by a special ideal functional element—unistor, letting current to flow only in one direction. The resultant homogeneous theoretical scheme can be handled with the use of topological methods of circuit analysis (Starzyk & Sliwa, 1984). Thus, the functional schematic circuit diagram corresponds to a particular equation set and, at the same time, it is equivalent to some flow scheme.

Nanosystem as Electronic Nanocircuit-Models from the History of Science

The nanomachines can be regarded as nanoelectrical switches in the nanocircuit. In nanotechnology define a nanomachne also as the nanocircuit. "Nanotechnological constructions are to reproduce traditional electronic components (switches, diodes, transistors, etc.) on a nanoscale. One main goal of this effort is to open up new dimensions of data processing, namely through the storage of large amounts of data in the smallest possible space… Because of the intermediary position of the nanoscale, it is also called 'mesoworld'" (Schiemann, 2005).

In the nanocircuit structure we can find traditional electronic components ("molecular-scale electronic components") of the different levels realized on the base of the nanotechnology:

1) First of all, such electronic elements as an electronic switch (e.g. transistor), wires, inductors and *capacitor* or *battery cell*;

2) Second, electronic units (blocs) as antenna ("radiates transmitted power in narrow beam for maximum 'gain' and receives backscattered signal from targets") or modulator ("to 'trigger' the transmitter operation at precise and regularly recurring instants of time") (Barrett, 2000-2002: p. 23);

3) Third, complex nanosystems as a hole (e.g. nanocomputer).

Nanoinductors, Nano-Capacitors, and Nano-Resistors

In the **Figure 3** you can see three basic circuit elements at optical frequencies—nanoinductors, nano-capacitors, and nano-resistors. "There is not that much difference between a battery

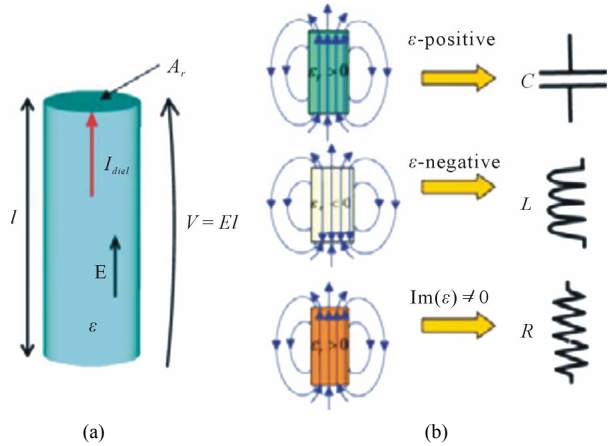


Figure 3.
(a) Geometry of a generic subwavelength nanocircuit element in the form of a nanowire with length *l* and cross-section *T A*; (b) Equivalent circuit model for the nanowire depending on the electrical properties of the material (Silveirinha, 2007).

and a *capacitor*… Conventional Faraday capacitors store electric charge between parallel charged plates that are separated by an insulating dielectric material. Instead of flat parallel plates, capacitors that come in tubes use two metallic foils separated by an electrolyte-impregnated paper in a "sandwich" that is rolled up into the tube. For these devices, nanotube thin films can increase the surface area of the conducting foil due to the nanotubes' very small size, orderly alignment and high conductivity. "Nanotubes provide a huge surface area on which to store and release energy-that is what makes the difference…" (Johnson, 2005).

Atomic-Scale Transistor and "Electronic Tube"

In nanoscience, such wave processes are investigated at the level of the single electron, atom, or molecule, as well as of the cluster of atoms and molecules. And at the basis of this research, for example, of the the wave function, a new nanosystem can be constructed, which is in principle similar to radio equipment or to those of its elements, such as the atomic-scale transistor (see **Figure 4**), which "can be reversibly switched between a quantized conducting on-state and an insulating off-state by applying a control potential relative to a third, independent gate electrode" (Xie, 2007), or "electronic tube" as two-dimensional nanostructure. Electron transport in nanostructures on helium films (Leider & Klier, 2008: p. 182). This is in principal similar with the three-electrode radio tube in the traditional electronic device. In engineering, schematic diagrams are more important than in science, since the peculiarity of engineering thought is operating with schemata and models. And these models adopt today from the history of science.

The atomic-scale transistor "can be reversibly switched between a quantized conducting on-state and an insulating off-state by applying a control potential relative to a third, independent gate electrode. For this purpose, an atomic-scale point contact is formed by electrochemical deposition of silver within a nanoscale gap between two gold electrodes, which subsequently can be dissolved and re-deposited, thus allowing open and close the gap". Here is the effect of this electrochemical cycling process and is discussed "the mechanisms of formation

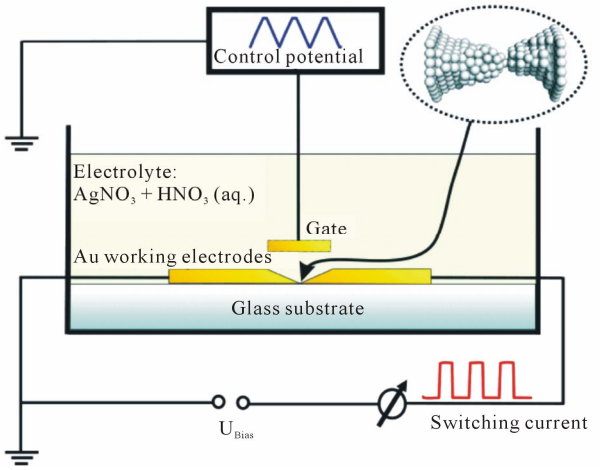


Figure 4.
Illustration of the experimental setup. "Silver quantum point contacts are electrochemically grown within a nanoscale gap between two electrodes deposited on a substrate. After repeated electrochemical deposition/dissolution processes, a bistable contact configuration is formed, and the reproducible switching of the contact between the two Au working electrodes is achieved by means of an independent gate electrode" (Xie, 2007: p. 115).

and operation of the atomic-scale quantum transistor" (Xie, 2007: p. 115).

In recent study of the nanotechnoscience is constructed "a molecular logic gate in a microfluidic system based on fluorescent chemosensors by detecting the changes in intensity as a response to various inputs (pH, metal ions)" (Berger, 2007) (see **Figure 5**). In principle mode of functioning of this electronic switch not differ from the coherer—an electrical component formerly used to detect radio waves, consisting of a tube containing loosely packed metal particles (filing in coherer of Branly (see **Figure 6**) by Popov's receiver or nickel powder (by Marconi). The waves caused the particles to cohere, thereby changing the current through the circuit (see Gorokhov, 2006: pp. 21-22).

Miniaturized Antenna on the Micro- and Nanometer Scale

We can speak about for instance nanoantenna sensors in the visible and infrared regime: "In order to detect electromagnetic radiation, one needs two basic elements: 1) a physical structure that efficiently couples to the radiation—the antenna; and 2) a rectifying element that converts the high-frequency AC signal to a low-frequency signal that can be detected by electronic means. Antenna structures and rectifying diodes have long been studied and applied for radio waves, television signals, cell phones, and so on. Recent work has shown that miniaturized antennas on the micro- and nanometer scale can be tuned to infrared and visible radiation, and that these nanoantenna structures can be integrated with metal-oxide-metal (MOM) rectifying diodes. The sensor consists of a MOM diode integrated together with a dipole antenna" (Bernstein, 2006: pp. 133-138).

Analogy between an early Hertzian antenna to operate at microwave frequencies and the nanodimer antenna see in **Figure 7**. "The pioneering work of Hertz at the end of the nineteenth century is at the foundation of the modern antenna science and engineering, and therefore of an important part of current wire-

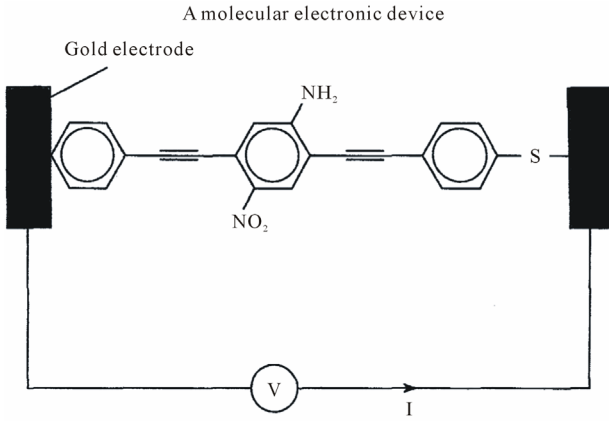


Figure 5.
"Illustration of *an electronic switch* made of a conducting molecule bonded at each end to gold electrodes. Initially it is nonconducting; however, when the voltage is sufficient to add an electron from the gold electrode to the molecule, it becomes conducting. A further increase makes it nonconducting again with addition of a second electron" (Pool & Owens, 2003: p. 351).

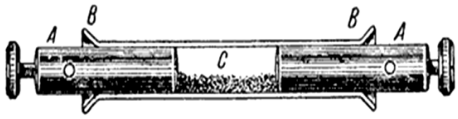
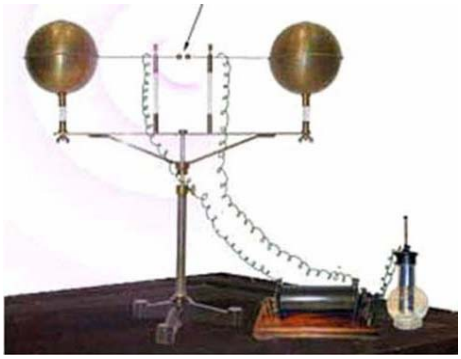
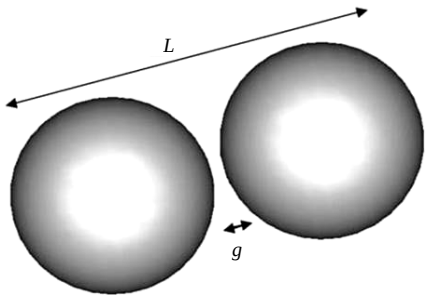


Figure 6.
Coherer of branly (Gorokhov, 2006: p. 48).



(a)



(b)

Figure 7.
Analogy between two dimer antennas: (a) An early Hertzian antenna to operate at microwave frequencies; (b) The plasmonic nanodimer antenna in the form of two closely spaced spherical nanoparticles (Alù, 2008: 195111-1).

less technology. His intuition of driving oscillating charges distributed over two closely spaced spherical capacitors… has proven successful for generating the first class of working radiators, and it has paved the way to myriads of wireless applications in the current technology... Currently, the theory and practice of RF antenna design is well established, and the old geometry of Hertz's first antennas… would definitely look outdated, compared with the myriad of different antenna designs currently available for numerous different purposes and applications… However, for different reasons *the optical nanoantenna science is still in its early stage*, and the recent experiments on optical nanoantennas may be well compared with the first attempts performed by Hertz… In this context, we have recently proposed a general theory that may bring and utilize the concepts of input impedance, radiation resistance, antenna loading, and matching of optical nanoantennas in order to translate the well-known and established concepts of RF antenna design into the visible regime" (Alù, 2008: 195111-1). This is right for nanocircuits at all.

Micrometer-Scale Silicon Electro-Optic Modulator

In radio electronics and radiolocation, modulation is the process of varying one or more properties of a high frequency periodic waveform to receive a modulating signal with help of modulator. "Because of the high rate of switching (many hundreds of pulses per second) and the very short time intervals being used (a few microseconds at the most for the pulse duration) the transmitter operation cannot be controlled by normal switches or relays. The circuit which does this switching, and also supplies the input power required by the oscillator, is the modulator. It is an electronic circuit which is 'triggered' by the output from the master timing unit and which produces a d.c. pulse whose duration is determined by the circuitry of the modulator. This d.c. pulse of controlled pulse duration, recurring at the precise instants of time determined by the master timing unit, is used to switch the oscillator on and off (Barrett, 2000-2002: p. 16). The same nanoblock as modulator we can see in the nanotechnology. "Much of our electronics could soon be replaced by photonics, in which beams of light flitting through microscopic channels on a silicon chip replace electrons in wires. Photonic chips would carry more data, use less power and work smoothly with fiber-optic communications systems. The trick is to get electronics and photonics to talk to each other… Now Cornell University researchers have taken a major step forward in bridging this communication gap by developing a silicon device that allows an electrical signal to modulate a beam of light on a micrometer scale… Their modulator uses a ring resonator—a circular waveguide coupled to a straight waveguide carrying the beam of light to be modulated. Light traveling along the straight waveguide loops many times around the circle before proceeding… The ring is surrounded by an outer ring of negatively doped silicon, and the region inside the ring is positively doped, making the waveguide itself the intrinsic region of a positive-intrinsic-negative (PIN) diode. When a voltage is applied across the junction, electrons and holes are injected into the waveguide, changing its refractive index and its resonant frequency so that it no longer passes light at the same wavelength. As a result, turning the voltage on switches the light beam off… The PIN structure has been used previously to modulate light in silicon using straight waveguides. But because the change in refractive index that can be caused in silicon is quite small, a very long straight waveguide is needed. Since light travels many times around the ring resonator, the small change has a large effect, making it possible to build a very small device. Tests using a pulse-modulated electrical signal produced an output with a very similar waveform to the input at up to 1.5 gigabits per second" (Steele, 2005).

Nanotechnology-Complex Electronic Circuitry with Multiple Junctions and Interconnects

An important area for development within molecular manufacturing is *systems design* of the extremely complex molecular systems. "Although the design issues are likely to be largely separable at a subsystems level, the amount of computation required for design and validation is likely to be quite substantial. Performing checks on engineering constraints, such as defect tolerance, physical integrity, and chemical stability, will be required as well" (Arnall, 2003: p. 37). "Because the switches are so tiny, they operate in the realm of quantum physics, which opens the possibility of using the switch to make a multi-bit memory device… The researchers also used the switches to form the basic binary logic gates required to make computer processor chips. They made an AND gate using two switches formed from a single silver sulfide wire and two platinum wires combined with a resistor that restricts electric currents to specific voltages. An AND gate produces a 1 only if both inputs are 1. They made an OR gate using two switches formed from two silver sulfide wires and a single platinum wire combined with a resistor. An OR gate produces a 0 only if both inputs are 0. They made a NOT gate using one switch combined with two resistors and a capacitor, which briefly stores electric charge. A NOT gate turns an input of 1 into 0 and vice versa" (Smalley, 2005).

Analysis and Synthesis of the Nanocircuits from the Point of View of the Electrical Circuits—Historical Transfer of the Methodology for the Research of the New Types of the Technical Systems

Following the paradigm of the electric circuit theory nanocircuits may be considered in different frequency regimes as complex circuits consists of the three basic elements of any linear circuit, R, L, and C. For example, pass-band optical nanofilter can be described as parallel RLC resonance (see **Figure 8**) and stop-band optical nanofilter als series LC resonance. fabricating nanofilters in optical lumped nanocircuit devices… The importance of transplanting the classical circuit concepts into optical frequencies is based on the possibility of squeezing circuit functionalities (e.g., filtering, waveguiding, multiplexing…) in subwave length regions of space, and on correspondingly increasing the operating frequency with several orders of magnitude. Moreover, nowadays the interest in combining optical guiding devices, as optical interconnects, with micro- and nanoelectronic circuits is high…, since it is "Following the nanocircuit theory, we show how it is possible to design such complex frequency responses by simple rules, similar to RF circuit design, and we compare the frequency response of these optical nanofilters with classic filters in RF circuits. These results may provide a theoretical foundation for not still possible to perform all the classic circuit operations in the optical domain. Introducing new paradigms and feasible methods to bring more circuit functionalities into the optical domain would rep-

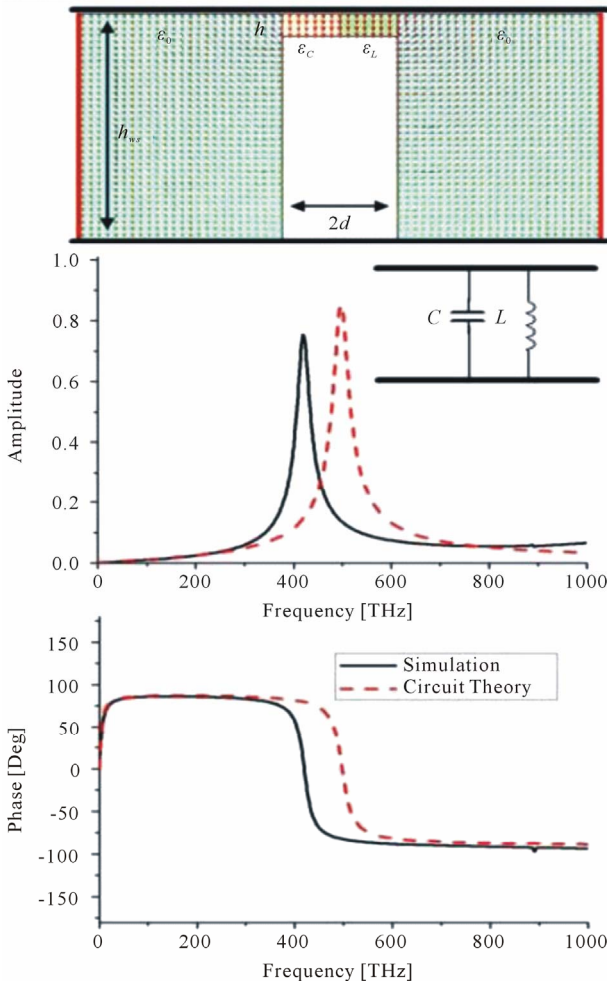


Figure 8.
Transfer function (amplitude and phase) and electric field distribution at the resonance for an optical pass-band nanofilter formed by two nanorods juxtaposed in parallel in a waveguide, one made of silicon and the other made of silver (Alù, Youngy, & Engheta, 2008: 144107-4).

resent an important advance in nanoelectronics technology… we have introduced and discussed the fundamental concepts for developing a novel paradigm for optical nanocircuits, with the aim to extend classic circuit concepts, commonly available at RF and lower frequencies, to higher frequencies and in particular to the optical domain. Specifically, we have discussed… how a proper combination of plasmonic and non-plasmonic nanoparticles may constitute a complex nanocircuit at infrared and optical frequencies, for which the conventional lumped circuit elements are not available in a conventional way. After introducing the nanocircuit concepts for isolated nanocircuit elements…, and after having applied them to model infinite stacks of nanoelements to design nanotransmission lines and nanomaterials…, we have been interested in analyzing in details how the connections and interactions among the individual nanoelements may be modeled and designed in a complex optical *nanocircuit board* with functionalities corresponding to those of a classic microwave circuit" (Alù, Youngy, & Engheta, 2008: 144107-1).

In principle, the both procedures analysis and synthesis are similar since the synthesis of a new technical system involves the analysis of the existing similar devices.

The engineering theory function is by "shuttle" iteration. First, an engineering problem consisting in construction of some technical system is formulated. Then it is represented as an ideal structural scheme which is then transformed into a natural process scheme showing technical system function. To analyze and mathematically model this process, a functional scheme representing particular mathematical relationships is constructed. The engineering problem is thereby reformulated into a scientific problem, and then into deductively solved mathematical problems. This upward way is termed the *ana1ysis of schemes.*

The reverse way—the *synthesis of schemes*—makes it possible to use the available structural elements, more specifically the corresponding abstract objects, to synthesize a new technical systems (more specifically, its ideal model, theoretical scheme) in accordance with definite rules of deductive transformation, calculate basic parameters of the object and simulate its function. The solution obtained at the ideal model level is gradually transformed to the engineering level where such engineering parameters as overall dimensions and weight of parts, types of connections, connection and part screenings from side electromagnetic effects, the best structural arrangements, etc., considered to be secondary parameters from the ideal model viewpoint, are taken into account and additional theory-correcting computations are performed. Thus, the lower level of engineering-theory abstract objects (structural schemes) directly involves empirical (structural & technical and manufacturing) knowledge, and is intended for utilization in engineering. It is this last fact that largely determines the specific feature of design-oriented engineering theory: to its abstract objects there must correspond a class of hypothetical technical systems which have not been created yet. Therefore, both analysis and synthesis of theoretical schemes of technical systems are important in engineering theory (see **Figure 1**).

In the analysis of an electric circuit in the electric circuit theory, the initial scheme is a structural diagram of an electric device. In conformity with the problem being solved, it is substituted by an equivalent flow scheme valid for the functional mode of the device, the substitution being done in accordance with special rules. Further transformations of the latter scheme are aimed at obtaining simpler schemes which will be more suitable for computations. With this aim in view, special theorems are proved, definite scheme transformation rules formulated and standard design methods described. The synthesis of schemes consists in finding electric circuit elements which can ensure the required functional mode meeting the conditions specified in the form of a certain mathematical relationship. To simplify synthesis, use is made of standard schemes, tables of standard circuits and corresponding mathematical relationships. In engineering practice, pure synthesis is extremely rare; certain parameters of a technical system and its elements are generally specified as early as in the problem statement and synthesis is often reduced to mere updating of an earlier device. Moreover, engineering practice always uses traditional empirical structural schemes, usually ready-to-use ones. Therefore, synthesis is reduced to analysis and what is to be determined is a few parameters of the newly designed circuit. At this stage the engineer often resorts to iteration methods, based on successive approximation; he approaches to the solution step by step, returning to the initial problem more than once. In mature engineering practice associated with mass and series production,

technical systems are constructed of standard elements. Therefore, in theory, synthesis also involves the combination of standard idealized elements in accordance with standard rules of theoretical scheme transformation. Analysis is also reduced to the same procedure.

It is possible to extend the classic circuit concepts, commonly available at microwave and lower frequencies, to higher frequencies and in particular to the optical domain (**Figure 9**). "We have developed accurate circuit models at optical wavelengths to characterize the equivalent impedance of the envisioned nanocapacitors and nanoinductors. It has also been shown that the induced displacement current may leak out of the subwavelength nanocircuit elements, causing strong coupling between the nanoelements and the neighboring region. To circumvent this problem, we have introduced the concept of optical nanoinsulators for the displacement current… We have confirmed, both analytically and numerically, that *nanocircuit elements… may be accurately characterized using standard circuit theory concepts* at optical frequencies, and in particular they may indeed be characterized by an equivalent impedance for nanocircuit elements. We have further explained how to apply the proposed circuit concepts in a scenario with realistic optical voltage sources. We have also studied how to ensure a good connection between the envisioned lumped nanoelements… This has led us to consider unit nanomodules for lumped nanocircuit elements, which may be regarded as *building blocks* for more complex nanocircuits at optical wavelengths" (Silveirinha, Alù, Li, & Engheta, 2007: p. 64).

Analytical quasi-static *circuit models* ("modeled theoretically") for the coupling among small nanoparticles excited by an optical electric field in the framework of the optical lumped nanocircuit theory in **Figure 10** are of importance in the *understanding* of complex optical nanocircuits at infrared and optical frequencies.

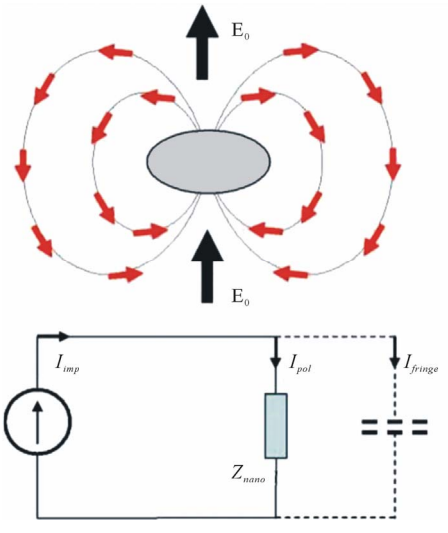


Figure 9.
(Color online) A nanoparticle illuminated by a uniform optical electric field E_0 (black arrows) may be viewed in terms of the circuit analogy presented… as a lumped impedance *nano Z* excited by the impressed current generator *imp I* and loaded with the fringe capacitance associated with its fringe dipolar fields (red arrows) (Alù, Salandrino, & Engheta, 2007).

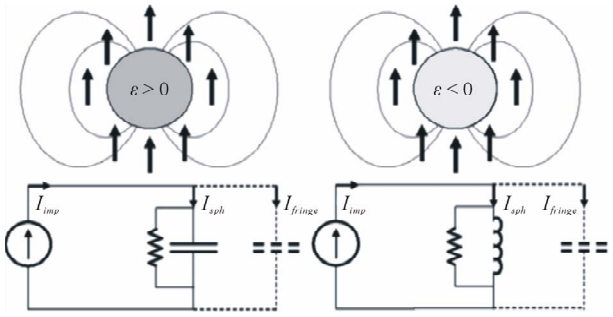


Figure 10.
A basic nanocircuit in the optical regime, using the interaction of an optical wave with an individual nanosphere. (left column) A non-plasmonic sphere with ε > 0, which provides a nano-capacitor and a nano-resistor; (right column) A plasmonic sphere with ε < 0, which gives a nano-inductor and a nanoresistor. Solid arrows show the incident electric field, and the thinner field lines represent the fringe dipolar field from the nanosphere (Engheta, Salandrino, & Aiu, 2004: p. 12).

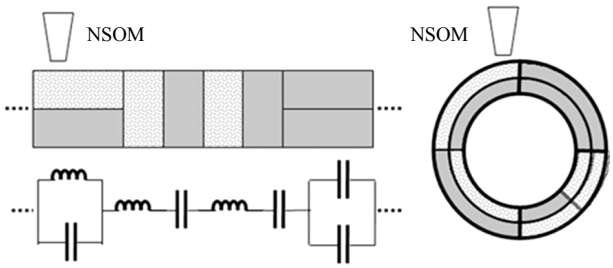


Figure 11.
Nanocircuit synthesis. (Top left) Conceptual nanocircuit formed by rectangular blocks of plasmonic and non-plasmonic segments; (bottom left) Its *equivalent circuit*; (right) A closed "nano-loop" (Engheta, Salandrino, & Aiu, 2004: p. 13).

Synthesizing nanocircuit elements in the optical domain using plasmonic and non-plasmonic nanoparticles from three basic circuit elements, i.e., nanoinductors, nano-capacitors, and nano-resistors see for example in **Figure 11**.

"All these concepts are important steps towards the possibility of synthesizing a complex optical *nanocircuit board* with the functionalities analogous to a classic microwave circuit (e.g., filtering, waveguiding, multiplexing…)". Such approach "would allow one to *quantitatively* design and *synthesize* desired nanocircuits (such as nanofilters, nanotransmission line, parallel and series combination of nanoelements, etc.) at optical frequencies using properly designed collections of nanoparticles acting as "lumped" nanocircuit elements. This concept may open doors to design of more complex nanocircuits and nanosystems in the optical domains" (Alù, Youngy, & Engheta, 2008).

This methodology is typical for the engineering sciences at all and was developed already in the theory of mechanisms in the end of the 19th century. For example Fr. Reuleaux defines in his "Kinematics of Machinery. Outlines of a Theory of Machines" (Reuleaux, 1875) kinematic analysis and synthesis as follows: Kinematic analysis consisted in decomposing the existing machines into their component mechanisms, chains, links and pairs of elements, i.e., in determining the kinematic composition of the machine involved. The final result of that analysis was the choice of kinematic pairs, links, chains and mechanisms to be used to assemble a machine for carrying out the required motions. Reuleaux differentiated between direct and

indirect synthesis. The former concerned the compositions of mechanisms which could effect particular changes of the body worked. This was possible when the mechanism was reduced to a kinematic pair. In that situation, the solution was the choice of a proper design for the elements of that pair. According to Reuleaux, the main method of theoretical synthesis of new mechanisms was indirect synthesis, i.e., the preliminary solution of all problems of a particular type, among which the method sought could be found. Such synthesis was possible because the number of realizable mechanisms was limited. First, all possible simple chains were investigated, which could be used to obtain a number of mechanisms by changing the ratio of various links to that chain, transforming some links of that chain into a fixed member, replacing some mechanism pair by another one, etc.

The operation of nanotheory is realized also as in the engineering theory by the iteration method. At first a special engineering problem is formulated. Then it is represented in the form of the structural scheme of the nanosystem which is transformed into the idea about the natural process reflecting its performance. To calculate and mathematically model this process a functional scheme is constructed. Consequently, the engineering problem is reformulated into a scientific one and then into a mathematical problem solved by the deductive method. This path from the bottom to the top represents the analysis of schemes (the *bottom up* approach). For instance, this can be the investigation of "the possibility of connecting nanoparticles in series and in parallel configurations, acting as nanocircuit elements" (Salandrino, 2007). The way in the opposite direction—the synthesis of schemes (the *top down* approach)—makes it possible to synthesize the ideal model of a new nanosystem from idealized structural elements according to the appropriate rules of deductive transformation, to calculate basic parameters of the nanosystem and simulate its function. Nanocircuit synthesis can be, for example, a synthesizing nanocircuit elements in the optical domain using plasmonic and non-plasmonic nanoparticles (Engheta, Salandrino, & Aiu, 2004).

Conclusion

Thus, the engineering theory function consists in solving particular engineering problems with the aid of theory-evolved procedures, type analyses which are suitable in various, more special (scientific and engineering) studies and engineering practice. The creation of new procedures of this kind, the elaboration of rules and proofs of theorems concerning the adequacy of equivalent transformations and allowable approximations, the construction of new standard theoretical schemes pertains to the engineering theory advance on the frontiers of the theoretical research in engineering sciences, and its findings, are stated in primary publications (first of all, in articles) whereas textbooks and monographs provide examples of the engineering theory function, theoretically classify and systematize proven methods of engineering problem solution, demonstrate their compatibility with the general system of theoretical knowledge of the engineering discipline involved. In the natural scientific theory primary importance are flow schemes, but not structural schemes. Both the mathematical apparatus and experiments are for natural scientist just a means of prediction and explanation of the natural processes. For example, Hertz in principle worked as an engineer, when designing new experimental equipment. But he did not mean to find some technical application for his experimental devices. One of the major problems of the well-developed engineering theory function in "copying" of type structural schemes for various engineering requirements and conditions. Then the solution of any engineering problems, the construction of any new systems will be theoretical supported. This is the essence of the constructive function of engineering theory (theory in engineering science), its lead of engineering praxis. His solution result is cast into practical-methodical recommendations (for designer, inventor, production engineer, etc.). To its abstract objects there must correspond a class of hypothetical technical systems which have not been crated yet. Therefore, in the engineering theory is important not only analysis, but first of all synthesis of theoretical schemes of technical systems. So nanotechnology is at the same time a field of scientific knowledge and a sphere of engineering activity, in other words—NanoTechnoScience—similar with Systems Engineering as the analysis and design of complex man/machine systems but now as large-scale micro- and nanosystems. That is why is very important to investigate the historical sources of the nanotechnological methods in the history of science and technology.

The engineering theory function is aimed at approximation of the theoretical image of an technical system, its equivalent transformation into some new, simpler scheme which will be more suitable for computations, at the reduction of complex cases to simpler and standard ones for which a ready-to-use solution exists, Therefore, the major attention of the engineering theorist is directed at evolving standard solutions of engineering problems, standard design-simplifying methods. It also largely determines the nature of engineering theory supporting the validity of such equivalent transformations and approximations. No matter whether the analysis, synthesis of schemes or mere engineering computations are done, the following general "algorithm" of engineering theory function can be formulated (see **Figure 12**).

1) In the starting point of the process of the theoretical solution of a new engineering problem, the initial conditions of this problem, engineering requirements and limitations and possible analogies with previously solved problems are formulated in terms of structural & technical and manufacturing knowledge. This procedure can be termed the engineering problem conceptualization.

2) The empirical description shall be theoretically formulated in concepts and notions which are standard for the engineering theory involved. This procedure can be termed the identification of the engineering problem with a scientific problem, i.e. the setting-up of a correspondence between the technical system under design and investigation and a particular theoretical scheme of the engineering theory involved. The result is a structural scheme constructed of idealized elements taken from a standard elements catalogue.

3) The so constructed structural scheme is transformed into a simpler type scheme by the first-order approximation. The transformation is accompanied by singling out technical system parameters which are the most important in the problem involved. Equivalent transformations (the formation of substitution schemes) are used to form flow schemes for various modes of technical system function, specified in the problem statement. If a complex flow scheme cannot be approximated, in one or several steps, to the simplest type diagram for which there exists a standard theory—evolved solution (if even these manipulations are not required, the solution is found directly from table

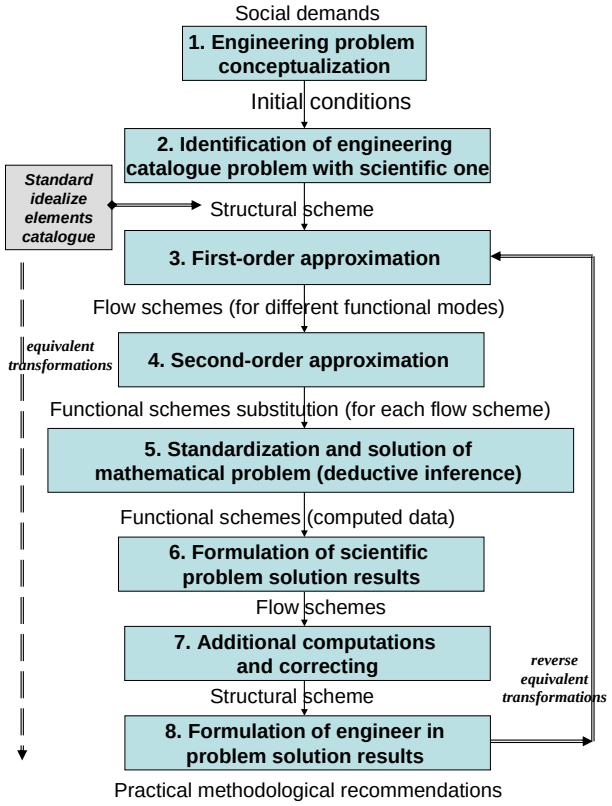


Figure 12.
General algorithm of engineering theory function.

formulas), it is substituted by an equivalent functional scheme in accordance with definite rules of correspondence.

4) A functional scheme constructed with the aid of the second—order approximation is used to formulate an equation set to be solved by special mathematical methods (e.g., by matrix ones). These equations are obtained on the basis of physical (Ohm's, Kirchhoff's and other) laws setting up, for example, a relationship between circuit current parameters and circuit element parameters. Their concrete numerical values known from the problem statement make it possible to determine unknown current and circuit element parameters through solving the equations.

5) The functional scheme is used to solve the mathematical problem using a standard computational procedure and standard problem solution methods based on previously proved theorems. To this end, the functional scheme is reduced to a standard one in accordance with definite rules of substitution. Thus, in the electric circuit theory, mixed connections are transformed into simpler, series and parallel ones, multiloop circuits are turned into single—loop ones, etc. In the electric circuit theory, such simplifying transformations are based on specially proved equivalence of some type schemes (e.g., of a "delta" and "star" and vice versa) and relevant theorems (say, the equivalent current and voltage source theorem) which give more computationally suitable schemes. This makes it possible to substitute certain circuit sections by other, equivalent and scheme—simplifying ones. The problem solution result obtained, by mathematical methods is translated to the flow scheme level by reverse equivalent transformation. Scientific problem solution results are formulated. Several flow schemes (for various functional modes) are then synthesized into an engineer object structural model.

7) Then the solution is adapted to a specific case and partly modified, i.e. additional computations are done and structural and engineering amendments introduced. It is necessitated by the fact that both the analysis and synthesis of schemes are invariably based on a compromise, trade—off between the complexity and accuracy of computations, on approximate methods and standard artificial techniques. The findings of theoretical computations must be corrected to take account of various engineering, social, economical, ecological and other requirements. It may call for the incorporation of new elements satisfying these requirements into theoretical schemes; these elements may be considered as connotations (additional, accompanying attributes) of these schemes. Framing a system of connotations which are incorporated into engineering-theory theoretical schemes as special elements may make it necessary to multiply return to previous stages (the iteration procedure) in order to construct new flow and structural schemes (corrected for these connotations), perform new approximations, equivalent transformations and computations. One of the major problems of well-developed engineering theory function is "copying" of type structural schemes for various engineering requirements and conditions. Then the solution of any engineering problems, the construction of any new engineering systems of a given type will be theoretically supported. This is the essence of the constructive function of engineering theory, its lead of engineering practice. Otherwise its function will amount only to solving routine engineering problems.

8) The final procedure of engineering theory function is that the solution result is cast into practical methodological recommendations (for the designer, inventor, etc.).

The constructive application of nanoscience as technoscience is expressed in its guidance of development in engineering practice. In nanotechnoscience, therefore, a prediction of the flow of natural processes on the nanolevel is just as important as the replication of the structural diagram of a new nanosystem (for example, a spintronic component, such as the "spin valve"). The superconductivity re-entrant phenomenon opens genuine prospects for building a very rapidly operating device, the "superconducting spin valve" for superconducting spintronics. Graphene electronics could even manipulate electrons as quantum-mechanical waves (similar to light waves made up of photons) rather than as particles.

It is very important to differentiate real fabricated "large scale MEMS" or "large-scale carbon nanotube devices" as three dimensional nanostructures from equivalent circuit modelled their components. **Figures 13(a)** and **(b)** show "scanning ion microscope (SIM) image of inductor (L), resistor (R) and capacitor (C) in a parallel circuit structures with free space nanowiring" (Bhushan, 2004: p. 187).

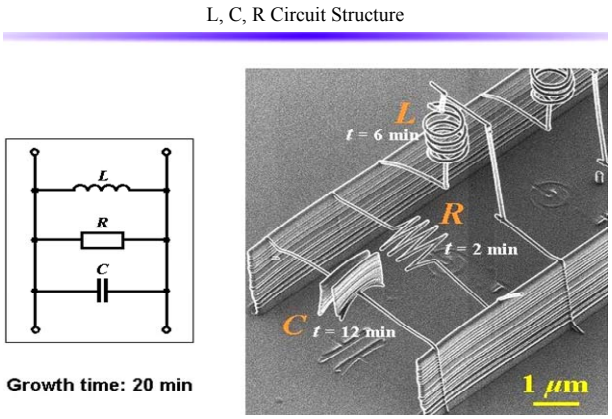
The "electrical engineering" schematic diagrams reflect physical processes which take place within the elements and units of radio engineering devices. Such diagrams deal with the calculation of parameters and the mapping of electric currents in standard electrical elements such as resistors, capacitors, and inductors. Of course, these devices can be called electrical circuit only with reservations. Use is made of electronics theory to describe the physical processes in the new radio engineering elements such as, for example, electron tubes or semiconductor devices. But to calculate of the parameters of these devices in which they are included use is, as a rule, made of traditional equivalent circuit (resistors, capacitors and inductors). As the

physical processes in elements of radiolocation devices (klystrons, magnetrons, cathode ray tubes, antennas, etc.) operating in new radio engineering regimes are different, it was necessary to modify the former methods of their calculation and representation or to develop new ones, as well as to develop new mathematical resources. The process was also stimulated by the need to investigate and develop methods of internal noise suppression in elements of radiolocation equipment (for example, the schrot effect in electron tubes). Similar is in the nanotechnology.

It is well-known that, in nanotechnoscience, constructs from various scientific theories—classical and quantum physics, classical and quantum chemistry, structural biology, etc.—are used, whereas, in nanosystems, different physical, chemical and biological processes take place. One can, however, also construct a circuit on the basis of definite nanosructures, such as, e.g., a super-heterodyne radio receiver on the nanolevel (**Figure 14**).

One of the important methods in the engineering sciences and also nanotechnscience is an approximation. The implementation of engineering theory involves a sequence of so-called approximations. For example, in electronics, the two-port theory is used to analyze complex circuits, the parameters of which are difficult to determine, owing to the awkwardness of the computations. Approximation is the substitution of some mathematical functions or designs by other, very similar, simpler functions or designs, which are equivalent in the desired aspect and for which known solutions exist, or can easily be obtained. In engineering sciences, this is a method for solving engineering problems on the basis of theoretical models and with the aid of a series of equivalent substitutions and transformations. The method of approximation is essentially a compromise between the accuracy and the complexity of designs. Accurate approximation usually involves complex mathematical relationships and computations. An oversimplified equivalent scheme of a technical system affects the accuracy of computations. The approximating expression or scheme must express the nature of the function or scheme under approximation as accurately as possible, and be as simple as possible, in order to simplify the mathematical solutions of engineering problems. Any approximation calls for a special substantiation of solution adequacy, one type of approximation being preferable for one functional mode and other types being preferable for other-modes).

The two-port concept is introduced to facilitate the transition to mathematical relationships, making it possible to apply Kirchhoff's laws, which describe the natural process of current flow in the two-port circuit, and the corresponding equations in the matrix form. The coefficients of these equations are called two-port parameters, because they are determined solely by the two-port's properties. By solving these equations with the aid of the matrix theory, one can determine the structural parameters of two-ports sought—input resistance, input and output



(a) (b)

Figure 13.
Scanning ion microscope (SIM) micrograph of inductor (L), resistor (R) and capacitor (C) structures: (a) equivalent circuit modelled (b) three dimensional nanostructure (Bhushan, 2004: p. 186).

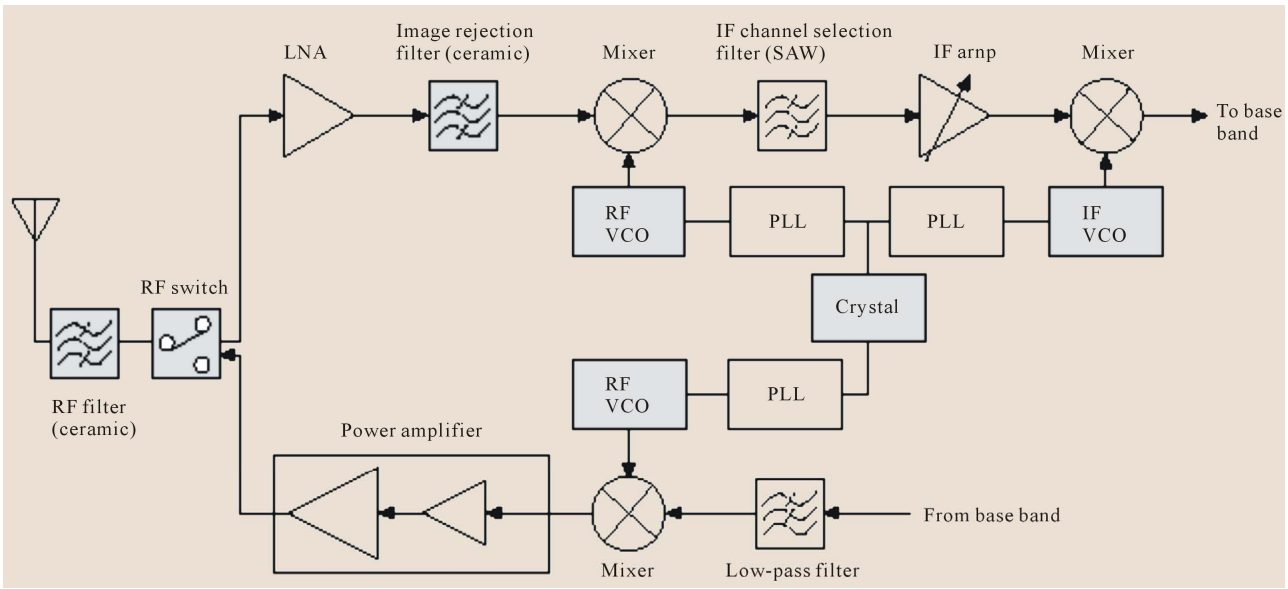


Figure 14.
Schematic of a super-heterodyne radio architecture (VCO = voltage-controlled oscillators, radio frequency (RF) and intermediate frequency (IF), SAM = self-assembled monolayer, PLL = phase-locked loop, LNA = low-noise amplifier) (Bhushan, 2004: p. 240).

power, insertion loss, etc. A number of theorems (the reversibility theorem, equivalent oscillator theorem, etc.) are proved in two-port theory. Its use makes it possible not only to simplify the computations, but also to synthesize new models by deductive equivalent transformation of two-ports. Such a transformation gives the most economical and effective engineering solutions. It indicates natural restrictions on these transformations, the main types of two-ports and the types of their connections. It should be noted that, in analyzing complex circuits, these are preliminarily transformed into a combination of simpler two-ports, the parameters of which are taken from special tables. Matrices for each of them are then used to carry out mathematical operations (addition, multiplication, etc.), depending on their connection type.

Several types of mathematical methods correspond to the same engineering theory. This is due to the fact that ideal objects are investigated at different levels. We have just considered the two-port theory and its mathematical apparatus. However, electric circuit analysis also involves the concept of a one-port making up larger structural "building-blocks", or units. (The one-port is a two-pole circuit section to which a difference of potentials is applied and which carries current.) Any amplifier, oscillator, filter, etc. can be considered to be a sum of capacitors, inductors, resistors, current and voltage sources. The latter are also idealizations, i.e., circuit theory deals with a comparatively small number of ideal elements and their combinations, representing these ideal elements at the theoretical level, and not with a great variety of radio-device structural elements differing in their characteristics, principles of operation, designs, etc. To apply the mathematical apparatus, further idealization is required; each of the above elements can be considered to be an active or passive one-port.

The methodological investigation of the history of science is very important to understand a methodology of the new scientific fields.

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Reflections on the Scientific Conceptual Streams in Leonardo da Vinci and His Relationship with Luca Pacioli

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Leonardo da Vinci (1452-1519) is perhaps overrated for his contributions to physical science, since his technical approach. Nevertheless important components concerning practical problems of mechanics with great technical ability were abounded. He brought alive again the Nemorarius' (fl. 12th - 13th century) tradition and his speculations on mechanics, if immature made known how difficult and elusive were the conceptual streams of the foundations of science for practitioners-artisans. Leonardo also had an interesting and intense relationship with mathematics but merely unhappy insights in his time. The meeting with Luca Bartolomeo de Pacioli (1445-1517) was very important for da Vinci since proposing stimulating speculations were implemented, but they were not definitive theoretical results. In this paper historical reflections notes on mechanics and mathematics in da Vinci and his relationships with Pacioli are presented.

Keywords: *Scientia de Ponderibus*; Mathematical Renaissance; da Vinci; Pacioli; Mechanics

An Outline

The emergence of the figure of the engineer seen as a technician in some way educated in sciences, is a characteristic feature of the XV century and the first half of the XVI. Indeed this is perhaps the main feature of science, where the reduced creativity (real or apparent) of *pure* scientists, was counterbalanced by the great creativity of *applied* scientists. A short list is sufficient to give an idea of the dimension of the phenomenon: Mariano di Jacopo called Taccola (1381-1458), Leon Battista Alberti (1404-1472), Francesco di Giorgio Martini (1439-1501), Leonardo da Vinci, Vannuccio Biringuccio (1480-1539), Francesco de' Marchi (1504-1576), Giovanni Battista Bellucci (1506-1554), Daniele Barbaro (1513-1570). Although there were no public funding to encourage scientists to devote their efforts to the study of technical applications and to the improvement of their knowledge, a common ground arose, particularly in Central and Northern Italy. The link between engineers and scientists emerged, at least in part, through the creation of some technical centres in the courts of the principalities which had been set up. This was the case of Medici's court in Florence, but also, and perhaps more importantly, the court of Milan under Francesco Sforza with its very rich library. Particularly in Urbino, Francesco di Giorgio Martini (1480-1490) wrote a translation of Vitruvius (see book X on machines) into Italian, questionable from a philological standpoint and Piero della Francesca (1415-1492) one of the greatest mathematicians and painters of the time, should be reported (Pisano, 2007, 2009; Pisano & Capecchi, 2008, 2009, 2010a, 2010b, 2012).

Leonardo introduced the concept of *pratica* (Gille; Sarton) as the basis of any of his studies, defining it either as observation, a study of buildings, of human anatomy and natural phenomena, or as an experiment aimed at checking up the calculations derived from his observation. On the other hand, he defines himself *discepolo della sperienza*. To him, from *experience* we can derive, beyond good building practices, also rules that are not only the expression of aesthetic research but principally requirements for the proper performance of the *building organism*, considered at the same time as a living organism or a *macchina-ingegno*. He is an artist but also a technician and a scholar and it would be a mistake, assuming a position systematically too antithetic to the official thesis, to assimilate his notes to a definitive work of art. Then, we must say that an indirect continuity in a bend toward science shown by Leonardo emerges when considering that the themes he dealt with had already been studied in early 1400 by Taccola who was interested in the scripts of mechanics and military technology of Pneumatica by Philon of Byzantium (280-220 B.C.). As the majority of engineers by that time, Leonardo also studied the engineering works by Heron from Alexandria (fl. I-II? B.C.) though considered useless toys (Heron, 1575, 1893, 1900, 1999). On the other hand, they got enthusiastic before the futuristic technical designs by Leonardo in that when not copying it, they were strongly influenced by them, such as Hero's engine, windwheel, vending machine, force pump, Heron's fountain et al. Gille ends up his book with a hope:

> All our engineers were men of war. [...]. But the enquiry remains open: it might bring to light other works still languishing in the dust of libraries, it might also provide a

> more precise analysis of the notebooks which have never been published and which are full of information[1].

In spite of because no Greek and Latin knowledge he learnt, it is reasonable to think that he had no direct access to classical ancient works; on that he wrote interesting annotations in the *Codex Atlantico* and *Codex Leicester* (ex *Codex Hammer*). On his classical language education he wrote:

> I know very well that because I am unlettered some presumptuous people will think they have the right to criticize me, saying that I am an uncultured man. What unintelligent fools[2]!

Introduction

The privileged geographical position of Italy in the Mediterranean caused interesting commercial exchanges with Africa and the Middle East that favoured the free circulation and the widespread of Greek works throughout Italy and Northern Europe. On the other hand, when the Turks captured Constantinople (1453) many Greek scholars moved to Europe (several of them to Italy as well), taking with them important manuscripts and making the knowledge of the classical culture more accessible, compared with the past 12th and 13th centuries. The translation into Latin straight from the Greek language made their contents more reliable. Reliability increased thanks to the invention of movable type printing (ca. 1450) by Johann Gutenberg (1400?-1467?). Approximately, since 1474 they started to print works of mathematics, astronomy and astrology in Italy. The edition[3] (*Elementa geometriae*) by Giovanni Campano di Novara (1220-1296) might have been one of the first translations of the *Elements* by Euclid (fl 300 BC) in its Latin version (Knorr, 1978-1979, 1985; Busard, 2005). It included speeches from *Arithmetica* by Jordanus de Nemore, commentary on Euclid by Anaritius (865-922) and several additions by Campano, too. In such a climate and until Renaissance the image of the new scientist, seen also as a student of natural phenomena, emerged. He was seen as a new type of scientist, re-born and re-qualified, not just an interested and clever astrologer and medieval theologian. Above all he looked now independent from a hypothetical and *general pre-established design.* However, the reconcilement between the divine plan and the new mathematical truths could converge into an outlined project, still divine under many aspects, considering God as the engineer who had planned a cosmological design in mathematical and geometrical terms. God as an engineer allowed a certain *chance* of studying the divine product that is nature interpreted in mathematical terms, since in this way the object of study was still confined to a religious matter. In fact, this would explain why, among other things, the majority of the Renaissance scientists were theologians as well (of course not usually theologians in the sense of their principal employment) who preferred to inquire into nature instead of the Holy Scriptures. Therefore each discovery or mathematical invention was seen as the product of God's engineering work[4]. Though this new way of conceiving it science was limited to the learned and the rich only, since they had a knowledge of Latin and Greek. The spread of the new culture by print was hampered by two factors. First, a lot of technicians, such as architects and engineers, would have probably welcomed the application of geometry and mathematics as *theoretical science* to arts, navigation and architecture but the precarious diffusion of school education did not give the pioneers of *scientia activa* access to the necessary scientific heritage. Thus, according to some thought currents of history of mathematics, the expectation about the spread of the classical culture, instead of encouraging the highest erudition among mathematicians and, in general, of scientific topics, paradoxically seemed to exclude just the newborn class of scientists-mechanics who, far more numerous than theoretical scientists, felt a strong interest in the introduction of mechanical devices or of calculating ones within their treatises. Secondly, theoretical knowledge was the only one to be considered full and definitive, therefore experience was meant to be of secondary use, so the discoveries of technicians were ignored, eventually causing a strange regression toward the medieval culture typical of the Scholastics of 12th century. In particular, due to the lack of mathematical devices, technicians would feed their knowledge through the development of so-called procedures *by comparison*. Modelling by similitude were typical, after daily practice and based upon *make mistakes and correct*, almost to represent a sort of a practical, e.g., handbook of architecture. The scientific applications will flow into the new technology and will require more and more the integration of local activities and the managing skill of the artisans. This integration and the new reference to the Euclidean geometry will bring together with other physical-mathematical factors—that will be the case study of the present thesis—to the realization of the first projects, after *the aestimatio* modelling, that is approximated and designed on the spot.

Mostly, at the end of the Middle Age mathematics was taught essentially at universities and at abacus schools. In the university, mathematics was taught in the *quadrivium* (arithmetic, geometry, astronomy and music) of the faculties of arts, that while maintaining their autonomy, were instrumental to the training of future physicians and theologians (Duhem, 1988: X; Grant, 2001; De Ridder-Symoens, 2003; Grendler, 2002). The medical faculties of the early Renaissance were usually those in which mathematics had more space. Medicine was, in fact, connected to the study of astrology, which required the students to have rudiments of Ptolemaic astronomy and then knowledge of elements of geometry and arithmetic. Professors of these subjects were the masters of liberal arts of the *quadrivium*, whose teaching and research many of the mathematical works of the XV century are connected. However the place occupied by mathematics was still marginal and also the level of mathematical knowledge, which except for some teachers was limited to what was indispensable for the exercise of astrology. In fact it did not cover the study of so many Greek classics that at the time were already available in Latin translations from Arabic of the XII century.

During the 16th - 17th centuries mechanics was a theoretical science and it was mathematical, although its object had a physical nature and had social utility. Texts in the Latin and Arabic Middle Ages diverted from the Greek. In particular al-Farabi (ca. 870-950) differentiates between mechanics in the

[1]Gille, p 240; see also: Hall, 1997.
[2]da Vinci, *Codex Atlanticus*, f. 119v.
[3]Maybe made by Abelard of Bath (12th century) and annotated and edited by Campano. The edition in fifteen books, *Preclarissimus liber elementorum Euclidis perspicacissimi* [...] will published by Erhard Ratdolt in Venezia (1482). It is based on an Arabic translation from original Greek manuscript.
[4]Of course one should also take into account *Liber naturae* (for ex: Numbers, 2006; Harrison, 1955; Vanderputten, 2005; Ophuijsen, 2005; Kusukawa, 2012; Jesseph, 2004; Pedersen, 1992; Biagioli, 2003; Marcacci, 2009).

science of weights and that in the science of devices. On the other hand, the science of weights refers to the movement and equilibrium of weights suspended from a balance and aims to formulate principles. The science of devices refers to applications of mathematics to practical use and to machine construction. In the Latin world a process similar to that registered in the Arabic world occurred. Even here a science of movement of weights was constituted, namely *Scientia de ponderibus*. Besides this there was a branch of learning called mechanics, sometimes considered an activity of craftsmen, other times of engineers (*Scientia de ingeniis*).

On the *Scientia de Ponderibus*

The *scientia de ponderibus* saw the birth in the Arabic land (Capecchi, 2012, 2011). The status of a distinct *Scientia* to the science of weights first appeared in al-Farabi's (ca. 870-950) *Iḥṣā' al-'ulūm* (*Enumeration of the sciences*). In particular he definitely distinguished between science of weights and sciences of devices or machines. Al-Farabi (Schneider 2011) took six distinct sciences: language, logic, mathematics, nature, metaphysics and politics. The mathematics was divided into seven topics: arithmetic, geometry, perspective, music, science of weights and sciences of machines (Capecchi & Pisano 2013) or devices:

> As for the science of weights [emphasis added], it deals with the matters of weights from two standpoints: either by examining weights as much as they are measured or are of use to measure, and this is the investigation of the matters of the doctrine of balances (umūr al-qawl fi l-mawāzīn), or by examining weights as much as they move or are of use to move, and this is the investigation of the principles of instruments (uṣūl al-ālāt) by which heavy things are lifted and carried from one place to another.
> As for the science of devices [emphasis added], it is the knowledge of the procedures by which one applies to natural bodies all that was proven to exist in the mathematical sciences... in statements and proofs into the natural bodies, and [the act at] locating [all that], and establishing it in actuality. The sciences of devices are therefore those that supply the knowledge of the methods and the procedures by which one can contrive to find this applicability and to demonstrate it in actuality in the natural bodies that are perceptible to the senses[5].

The *Scientia de ponderibus* was different from Greek mechanics (Clagett and Moody [1952] 1960); Brown 1967-1968) both for the scope-Greek mechanics placed transportation of weights, instead of their equilibrium, at the centre—and for the methodology—the *Scientia de ponderibus* charged only of the theoretical foundations of equilibrium and not applicative aspects (Capecchi & Pisano, 2013; Pisano, 2013). The *Scientia de ponderibus* was also different from the mechanics of the early XVI, the *centrobaric*, a discipline developed in the wake of the rediscovery of Archimedes (fl. 287-212 B.C.) which was concerned mainly with the mathematical problems of determining the geometric centres of gravity of plane figures and solids (*Ivi*).

The new science of weights was characterized by a strong deductive system, in which components of qualitative and ideas in physics (Locqueneux) were formulated *more geometrico*. The most common historical point of view is that the science of weights originated from interplay of Aristotelian physics and the physical-mathematical theories of Archimedes and probably Euclid (Renn), on the equilibrium of bodies (Archimedes, 2002; Clagett, 1964-1984; Tartaglia, 1565a; Dijksterhuis, 1957).

From a methodological point of view the majority of treatises in the science of weights followed what is often called dynamical or more properly kinematical approach, in which the equilibrium is seen as a balance of opposing forces and the movement, virtual or real, has an important role. In these treatments the Aristotelian dichotomy, but not only, between the natural and forced, upward and downward, motions, disappears for they are considered on the balance, in which the weight is also the natural cause of lifting other weights. The geometrical approach, like the one carried out by Archimedes, is certainly uncommon, so that some historians does not even consider it as part of the science of weights.

In the Latin Middle Ages various treatises on the *scientia de ponderibus* circulated (Clagett 1959), as already mentioned in the introduction of this work. Among them, the most important are the treatises attributed to *Elementa Jordani super demonstratione ponderum* (version E), *Liber Jordani de ponderibus* (cum commento) (version (P), *Liber Jordani de Nemore de ratione ponderis* (version R) (Capecchi & Pisano, 2013). They were the object of comments up to the 16 century. It is not well known the distribution of the original manuscript; what is sure is that *Liber Jordani de Nemore de ratione ponderis* (version R) finished in Tartaglia's hands and was published posthumous in 1565 by Curtio Troiano as *Iordani opvsculum de ponderositate* (Tartaglia, 1565b; see also Tartaglia, 1554).

Generally, when the so-called *scientia pratica* of the Renaissance is referred to, we are reminded of engineers and, consequently, of Leonardo da Vinci, the great scholar who sums up a multiplicity of competences that nowadays would be considered as different crafts: from the engineer, architect, scientist to the artist (Pisano, 2007, 2009). Although some studies, such as from Pierre Duhem (1861-1916), Roberto Marcolongo (1862-1943), Clifford Truesdell (1919-2000) and Bertrand Gille (1920-1980) suggest a review of Leonardo da Vinci's role as a genius, in favour of a more human figure of a *learned man*, endowed with a quick intelligence, e.g. not all his designs about machines sprang out straight of his vision (Marcolongo, 1932; Truesdell; Gille).

The XV century records a check on the growth in the development of science and the publication of scientific papers. The check existed of course for the science of weights, too. In this case it also depended on the fact that the discipline, formulated axiomatically had reached its complete internal maturity and only the proposition of new problems would have lead to an evolution. Although until the early years of the XVI century no new major scientific treatise was written[6], except the *Summa de arithmetica*, *geometria*, *proportioni et proportionalità*[7] (hereafter *Summa*, Pacioli, 1494) and *De divina proportione* (Pacioli, 1509) by Luca Pacioli, it must be said that in this period the

[5]Othman, 1949: pp. 88-89. Interesting correlated comments are in Abattouy 2006, p. 12. See also Schneider, 2011; Abattouy, Renn, & Weinig, 2001. In the secondary literature one can also see the science of weights proposed as science of balances and science of weight lifting: Ibn Sina (980-1037), al-Isfizārī (1048-1116), al-Khāzinī (1115-1130).

[6]One can also see *Questiones super tractatum de ponderibus* (Pellicani) by Biagio Pellicani of Parma (d. 1416).

[7]The *Summa* was a teaching textbook mainly concerning general algebra.

foundations of a major renovation were laid down, with the breaking of the spirit of the scholasticism system and the repudiation of the principle of authority, particularly that of Aristotle (384-322 B.C.), the rediscovery of Plato (427-347 B.C.) and Pythagoras (570-495 B.C.) and the valorization of mathematics which was the premise for the new philosophy of nature of the second half of the XVI century (Pisano, 2011).

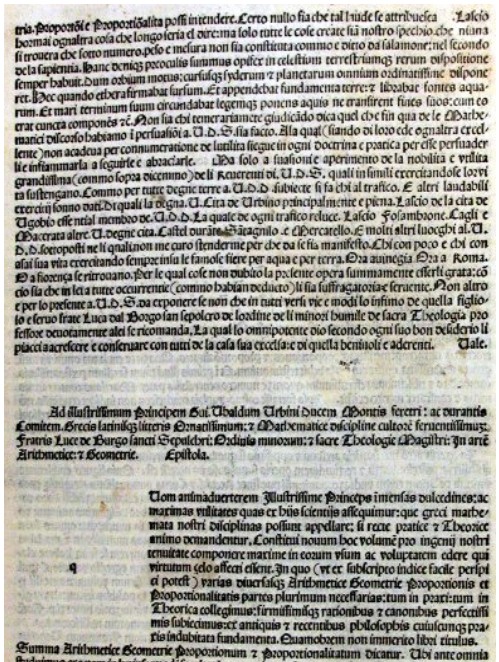
On Leonardo's Approach to Mechanical Science

In ancient Greece the term *Μηχανική* was used when referring to machines and devices in general. To be more exact, it was intended to mean the study of simple machines (winch, lever, pulley, wedge, screw and inclined plane) with reference to motive powers and displacements of bodies (Capecchi & Pisano, 2008, 2010a, 2010b). Historically works considering these arguments were referred to as *Mechanics*, from Aristotle, Heron, Pappus Alexandrinus (290-350 A.C.) to Galileo (1564-1642). None of the treatises entitled *Mechanics* avoided theoretical considerations on its object, particularly on the lever law. Moreover, there were treatises which exhausted their role in proving this law; important among them are *The Euclid book on the balance* by Euclid and *On the Equilibrium of Planes* by Archimedes (Archimedes, 2002). The Greek conception of mechanics is revived in the Renaissance, with a synthesis of Archimedean and Aristotelian routes. This is best represented by *Mechanicorum liber* by Guidobaldo dal Monte (1545-1607) who reconsiders *Mechanics* by Pappus (Pappus, 1588, 1970) maintaining that the original purpose was to reduce simple machines to the lever (dal Monte, 1581, 1588).

With the Renaissance in the XV century the medieval mathematics is joined by the new mathematics, or rather the rediscovered ancient Greek mathematics to which the humanist movement gave a great contribution. The essential role of Italian humanism in the renaissance of mathematics during the XV and XVI centuries was well documented in (Rose, 1975). Many humanists returned from their travels to Byzantium with codes of Apollonius (262-190 A.C.), Ptolemy (90-168 A.C.) Pappus, Heron written in Greek. In the early XVI century, within a few decades, many revisions and translations of classics were delivered, i.e., including the *De expetendis et fugiendis rebus* (1501) by Giorgio Valla, sort of rich encyclopaedic anthology of Greek scientific texts[8] where

> [...] the starting point for this renaissance of mathematics was the correction of Greek mathematical texts, to be undertaken by those who were expert in both the Greek language and astronomy. To make the refurbished traditions of Greek mathematics available to mathematicians generally, Regiomontanus from at least 1461 was engaged on a series of Latin translations. But by 1471, this means of communication was revolutionised by Regiomontanus' discovery of the new invention of printing. Through printing, an astonishingly rapid and accurate dissemination of texts and translations become possible that had been inconceivable in an age where manuscripts represented the sole means of circulating the written word. In its fusion of mathematics, Greek and printing Regiomontanus' publishing Programme of 1474 marks the formal beginning of the renaissance of mathematics[9].

It should however be said that the reacquisition of mathematical techniques was rather slow. The humanist thought carried on meta-mathematical character concerned a new role that mathematics acquired within the philosophy of the Platonic and Pythagorean instances. On that the role played by Pacioli, which was in the same time teacher of abacus and *magister theologiae*, was crucial. This job allowed him to mediate the culture of technicians and learned men. Nevertheless the biblical metaphysical idea inspiring *frà* Luca Pacioli in his dedicatory letter "[…] Fratris Luca de Burgo Sancti Sepulcri, ordinis minorum, sacre theologiae Magistri [...]" (Pacioli, *Summa*, f. 3r) to Guidobaldo da Montefeltro (1472-1508) as "Ad Illustrissimum principem sui Ubaldum Duces Montis Feretri, Mathematice discipline cultorem serventissimum […]" (*Ibidem*) was that the book of nature (later on resumed by Galileo[10], too) is written in mathematical characters:



Let all create beings be our mirror, as no one will found to be constituted but as number, weight and measure, as said by Salomon in the second book of the Sapientia[11].

Figure 1.
Plate from the initial part of the dedicatory letter by Pacioli (Pacioli, *Summa*, f. 3r)[12].

[8] *De rebus expetendis et fugiendis* consisted of 49 books, 30 on sciences. Valla's book also contains interesting notes on Archimedes' works.

[9] Rose, 1975, p. 110.

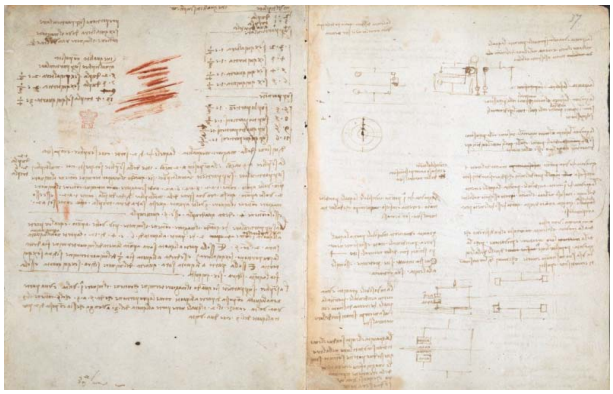
[10] Galileo, 1890-1909. See also: Galluzzi & Torrini, 1975-1984; Pisano, 2009d; Pisano & Bussotti, 2012; Marcacci, 2009.

[11] Pacioli, 1494, *Summa*, f. 4r. Evidently, he alludes to the biblical text around I century BC.

[12] Source: Max Planck Institute for the History of science–Echo/Archimedes Project [via http://echo.mpiwg-berlin.mpg.de/content/historymechanics/archimdesecho/archimedes-intro].

It is evident from the large production of the secondary literature with respect since his was more the mentality of the engineer. Leonardo's notebooks are not organized and minor eloquent[13] of the others authors at his time. He was a brilliant scholar, very intelligent and a great worker. His questionable assumptions on mechanics make known how complex, hard and mysterious were the conceptual streams science for its early practitioners. Taking into account that modern historiography (Pisano, 2009 and refs) reached the conviction that Leonardo got his results in part from other sources or that he would have written them previously together with other authors, we can reasonably make the hypothesis that the abundance of materials about his scripts and the lack of it in other cases could also be due to greater care when searching the documents of the brilliant scholar. Therefore it is difficult to make a hypotheses about an artist's inspiration. In fact, without a proper method of historical inquiry it is not so easy to deduce from his manuscripts what one author takes from another and what really represents scientific continuity or discontinuity (Pisano, 2009a, 2009b).

Leonardo's mechanics speeches are effetely scattered notes, often repeated with slight variations, sometimes with inconsistencies. Although attempts were made to reach a chronologically consistent order, the different scholars have not yet obtained results sufficiently shared, also because Leonardo had the habit of putting his hands to the manuscripts and edit them with continuous additions and deletions (Capecchi & Pisano, 2013). The only valid criterion is the search for the logical consistency and the persistence of certain statements over others. For example:

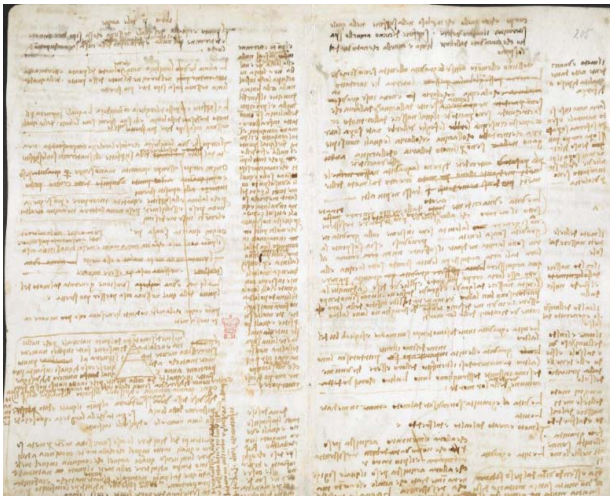


Gravity is an accidental power, which is created by motion and infused into bodies out of their natural site[14].
[…]
Gravity, force and accidental motion (material motion), together with percussion are the four accidental powers, by which all the evident work of mortal beings have their origin and their death[15].

Figure 2.
Studies on gravity and force[16] (da Vinci, *Codex Arundel* f. 37r).

[13]See, e.g., Martini's works on machines with several notes Leonardo da Vinci's hand were re-discovered.
[14]da Vinci, *Codex Arundel* f. 37r. See also: da Vinci, 1940: p 31.
[15]da Vinci, *Codex Forster II*, f. 116v. See also: da Vinci, 1940: p 32.
[16]The *Codex Arundel* is a collection (London, British Library) of papers written in his characteristic left-handed mirror-writing (reading from right to left), including diagrams, drawings and brief texts, covering a broad range of topics in science and art, as well as personal notes. It consist of 283 folia concerning physics-mechanics—and mathematics-optics and Euclidean geometry—(Euclid, 1945) architectural and territorial studies (Pedretti, 1998). Source: London British Library [via http://www.bl.uk/manuscripts].

Here Leonardo refers to the four powers (with a modern language, forces). Regarding the gravity it can be said that Leonardo married the Aristotelian thesis considering it as the tendency of bodies to reach their natural place[17]. For Leonardo gravity is caused by motion:



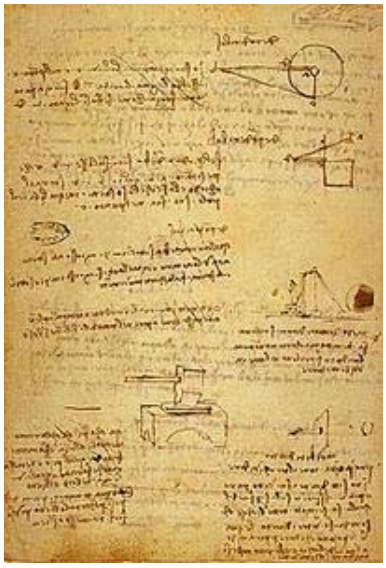
No element has in itself gravity or levity if it does not move. The earth is in contact with the air and water and has in itself neither gravity nor levity; it has not stimulus neither from the water nor from the surrounding air, unless by accident, which originates by motion. And this teaches us the leaves of herbs, born above the earth, which is in contact with the water and the air, which do not bend if not for the motion of air or water[18].
[...]
Gravity be an accident created by the motion of the lower elements into the upper[19].

Figure 3.
Studies on gravity (da Vinci, *Codex Arundel* f. 205r).

In brief, a body shows its gravity if, following an upheaval of the underlying parts, an imbalance of the upper parts is determined (Capecchi & Pisano, 2013). More problematic is the interpretation of the term force. On the purpose, quite clarifying was the following famous quotation, which is interesting from a literary point of view also, as a very effective example of scientific prose, in which studies have suggested the influence of the neo-Platonic philosophy of universal animation (*Ivi*).

It seems the impetus of scholastic conception (i.e., Oresme, Buridanus) which is generated in the bodies by the motion transmitted to it by another body, for example by the hand that launches a stone. Leonardo distinguishes between natural gravity and accidental gravity (Capecchi & Pisano 2013). The former is the ordinary one and is invariant, the latter is not clearly defined or at least is not defined in a unique way. According to Duhem (Duhem, 1905-1906: I, pp. 114-115; Duhem, 1906-1913), this term was used by the schoolmen as a synonym of impetus and Leonardo, following the ideas of Albert of Saxony (ca. 1316-1390) who assumed the natural gravity concentrated in the centre of gravity, would consider also the accidental concentrated in a point, named the centre of accidental gravity:

[17]On that some arguments, sometime *forced* are in: Duhem, 1905-1906: I, pp. 16-17.
[18]da Vinci, *Codex Arundel*, f. 205r. See also: da Vinci, 1940: p 30.
[19]*Ibidem*.



Force I say to be a strong spiritual virtue, an invisible power, which is caused by accidental external violence of motion and placed and infused into bodies, which are moved from their natural habit [the rest] and bent by giving them active life of wonderful power: constrains all created things to change form and site, runs with fury to her desired death and comes diversifying through the causes. Slowness makes her great and quickness weak, she comes into being from violence and dies for freedom and the greater the sooner is she consumed. Drives away in a rage what is opposed to her decay; she wants winning, to kill by her causes any constraints and winning, she kills herself. She becomes stronger where she finds a stronger contrast. Nothing will move without her. The body from which she originates does not change form or weight[20].

Figure 4.
Studies of the equilibrium of weights and of impact ("percossa")[21] (da Vinci, *Ms. A* f. 1v).

Each body has three centres of figure, one of which is a natural centre of gravity, the other of the accidental gravity and the third one of the magnitude[22].

On Leonardo's Approach to Statics Science

Leonardo's contribution to statics (Pisano, 2009a; Capecchi & Pisano, 2007) concerns the rule of composition-decomposition of a force along two given directions. The problem to be solved was to find the tensions of two inclined ropes supporting a weight. The forces of the ropes also were associated with weights[23].

Leonardo besides to formulate the rule also correctly proved it[24]. The analysis of texts has however led us to believe that in this case Marcolongo's analysis is correct and actually Leonardo recognized the rule of weight distribution in two ropes supporting a weight. There are of course, as typical in Leonardo (Pisano, 2009a), situations in which the rule is loosely worded, and sometimes wrongly (Capecchi & Pisano, 2013). However, although there are no certain dating criteria, the analysis of the manuscripts shows a long series of examples with a lot of correct arguments that can leave no doubt that Leonardo reached a conscious knowledge of the rule of composition of forces. The following quotations start from the intuitive finding that the weight distribution depends on the obliquity of the ropes.

> On weight. If two ropes converge to support a heavy body, one of which is vertical the other oblique, the oblique one does not sustain any part of the weight.
> But if two oblique ropes would support a weight, the proportion of weight to weight would be as the obliquity to obliquity.
> For ropes that descend with different obliquity from the same height, to support a weight, the proportion of the accidental weight of the ropes is the same as that of the length of these ropes[25].

Here by using the word *obliquity*, Leonardo rather than to the slope refers to the length of the ropes—see the final part of the previous quotation—while the accidental weight could be understood as the tension of the ropes. The statement is patently incorrect, but one could think that Leonardo had confused and meant to speak of the inverse ratio of obliquity, which is still wrong but at least the tendency is correct. In the following passage Leonardo's is not a typo, because he clearly states that the weight is divided into proportion of the angles formed by the ropes with the vertical, which is clearly false (Capecchi and Pisano 2013):

> Let consider two lines concurring in the angle which sustains the weight, if you draw the perpendicular which divides this angle, then the weights [tensions] of the two ropes have the same ratio as that of the two angles generated by the above division. If between the two lines *ac* and *ec*, which form the angle *c*, from which the weight *f* is suspended, the perpendicular dc is drawn that divides this angle into two angles *acd* and *dfe*, we say that these ropes will receive the weight in proportion equal to that of the two angles they form and equal to the proportion of the two triangles. And the perpendicular that divides the angle of this triangle will split the gravity suspended in two equal parts, because passing through the centre of such gravity[26].

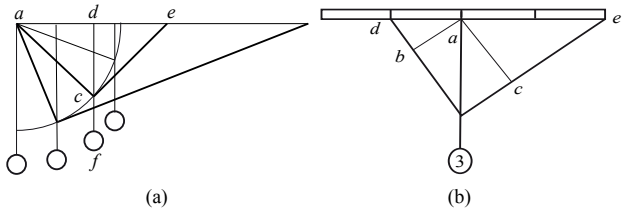


Figure 5.
(a) A wrong instance of decomposition of forces[27]; (b) A correct instance of decomposition of forces[28].

It is reasonable to suppose (Capecchi, 2012; Capecchi & Pisano, 2013) that Leonardo might have thought to a weight hanging from the middle of a rope in which the greater the obliquity—i.e. the angle they form with the vertical—the larger the tensions in the rope (*Ivi*).

[20]da Vinci, *Ms. A*, f. 34v. See also: da Vinci, 1940: pp. 253-254.
[21]Source: Istituto e Museo di Storia della Scienza, Firenze, Italy [via http://brunelleschi.imss.fi.it].
[22]da Vinci, *Codex Atlanticus* f. 188v (b). See also: da Vinci, 1940: p. 45.
[23]Of course the modern difference between force-weight (vectorial quantity) and mass (scalar quantity) is taken into account.
[24]This is normally not recognized by historians and even Duhem (who did not study the *Codex Arundel*) suggested only as a possibility that Leonardo understood the rule. Marcolongo only asserted with no doubt his priority.
[25]da Vinci Ms. E f. 70 r. See also: da Vinci, 1940: p. 142.
[26]da Vinci, Ms. E f. 71r. See also: da Vinci, 1940: p. 143.
[27]Capecchi & Pisano, 2013.
[28]*Ibidem*.

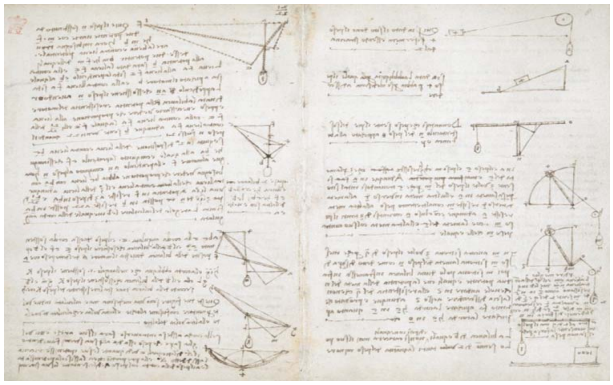
Marcolongo (Marcolongo, 1932) argues, however, that these wrong results date back to the years before 1508, when Leonardo had not yet reached his final idea which is well expressed in the passage:

> For the sixth and ninth [propositions], the weight 3 does not split into the two real arms of the balance in the same proportion of these arms, but in the proportion of the potential arms[29].

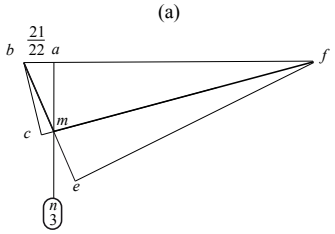
Here Leonardo asserts, without proving it, that the suspended weight is supported by tensions *b* (left) and *c* (right) having inverse ratio to the potential arms *ab* and *ac*, i.e.: *b*:*c* = *a*:*ab*. The relation, correctly, allows to find the ratio of tensions in the two ropes (Capecchi & Pisano, 2013).

In other *Codex*, Leonardo proves the asserted relation and also indicates the way to evaluate the absolute value of the tension in each rope. He introduces the terms: *potential lever* and *potential counter lever* (*Ivi*). The potential lever corresponds someway to the potential arm, the potential counter lever is the horizontal segment connecting one support of a rope to the vertical from the suspended weight. The reading of the following quotation is useful to illustrate the use of these terms. The potential lever associated to the arm *fm* is *fe*, the potential counter lever is *fa*.

> Here the weight is sustained by two powers, i.e. *mf* and *mb*. Now we have to find the potential lever and counter lever of the two powers. The lever *fe* and the counter lever *fa* will correspond to the power *mb*. The appendix *eb* is added to the lever *fe*, which is connected with the engine *b*; and the appendix *ab* is added to the counter lever *f*a, which sustains the weight *n*. By having endowed the balance with the power and the resistance of engine and weight, the proportion between the lever *fe* and the counter lever *ab* should be known. Let *fe* be 21/22 of the counter lever *fa*. Then *b* supports 22 when the weight *n* is 21[30].



(a)



(b)

Figure 6.
(a) Studies on levers[31] (da Vinci, *Codex Arundel* f. 7v); (b) Potential lever and potential counter leve[32].

[29]da Vinci, *Codex Arundel*, f. 1v. See also: da Vinci, 1940: p. 171.
[30]da Vinci, *Codex Arundel*, f. 7v. See also: da Vinci, 1940: p. 179.
[31]Source: British Library [via http://www.bl.uk/manuscripts].
[32]Capecchi & Pisano, 2013.

Attention is centred on the rope *bm* with the aim to find its tension. A similar argumentation can be repeated for the rope *fm*. Basically Leonardo imagines the rope *fm* as *solidified*, i.e. as a rigid beam hinged at *f*. According to his embryonic concept of moment of a force, Leonardo asserts the validity of the following relation: *b*:*n* = *fa*:*fe*, where *b* is the tension of the rope *bm* and *n* is the suspended weight. He gives as an example *fa*:*fe* = 21:22; for *n* = 21 it results *b* = 22. Previous quotation deserves some comments. First: the idea to solidify the rope anticipates what is commonly named solidification principle, according to which if a body is in equilibrium its state is not perturbed by adding additional constraints[33].

In others folia Leonardo da Vinci's observations on beams concern either the axial and flexional behaviour. For this last issue he focused more attention on its buckling. These considerations are interesting though not always formal and precise experimentally.

Finally, Leonardo is more concerned with deformability than strength (Capecchi & Pisano, 2013). The reason could be that he refers mainly to the timber used in building-war-machines and ships.

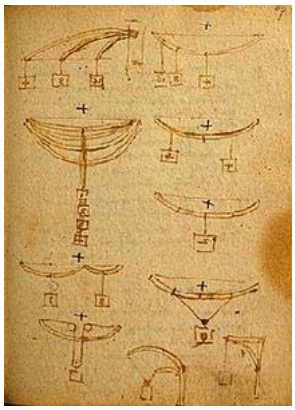


Figure 7.
Studies on beam[34] (da Vinci, *Codex Forster II*, f. 89v).

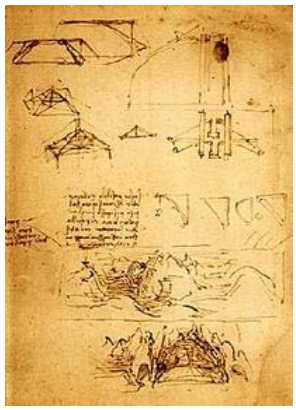


Figure 8.
Studies of the resistance of arches[35] (da Vinci, *Codex Arundel*, f. 224r).

These beams are very thick and resistant to failure, so they are essentially dimensioned for deformation.

> [A] One beam of 6 braccia is stiffer the double in its middle, than four equal sized beams of 12 braccia joined together[36].

Based on recent researches (Pisano, 2009; Capecchi & Pisano, 2010, 2013), the previous observation of Leonardo is in accordance with modern theory of elasticity of beams: a supported beam of constant section, highlighted *l* by means of a concentred force *f* applied to *mezzeria*.

The arrow *v* is mathematically interpreted by the following formula:

$$v = \frac{1}{48}\frac{fl^3}{EI} \qquad (1)$$

[33]This principle has been used to study deformable bodies by many scientists, including Stevin, (Dijksterhuis, 1955), Lagrange, Cauchy, Poinsot, Duhem (Capecchi, 2012; Pisano & Capecchi, 2013).
[34]Source: Istituto e Museo di Storia della Scienza, Firenze, Italy [via http://brunelleschi.imss.fi.it].
[35]*Ibidem*
[36]da Vinci L, *Codex Atlanticus*, f. 211rb, [p. 562r].

where E is the longitudinal modulus and I the moment of inertia of the section. From the previous track and considering (1), from 6 to 12 arms, that is, doubling the light, the same section and force f by formula above the arrow increased 8 times or *rigidezza* (rigidity) decreases 8 times. But 4 of 12 auctions arms absorb each 1/4 of the force f to which the arrow of four auctions together is equal to that of an individual charged with 1/4 f. The fall of each beam of 12 arms worth 1/4 to 8 times so it is only 2 times that of an arm of 6. It is thus the result of Leonardo in [A].

On Leonardo's Approach to Mathematical Science

Nowadays Leonardo da Vinci's cultural matrix seems clear. Historians agree in considering the Aristotelian physics as the main source of his mechanics. According to such studies from the analysis of *Codex* by Leonardo, it was possible to deduce some of the titles of the manuscripts[37], not entirely scientific, used by Leonardo for the researches: Abū Yūsuf Yaʿqūb ibn Isḥāq al-Kindī (801-873 A.C.) *Libellum sex quantitatum*, Gaius Plinius Secundus called Pliny the Elder (23-79 A.C.), *Naturalis Historia*, Aristotle[38], *De phisica* and *De metheoris*, Euclid, *De ponderibus*, *De levi et ponderoso fragmentum*, John Peckham (1225 ca-1292) *Perspective ciommunis*, Piero de' Crescenzi (1233-1320?) *De Agricultura*, Mondino de' Liuzzi (1270-1326) *Anathomia*, Paolo dell'Abaco (1282-1374) *Recholuzze del maestro Pagolo astrolacho*, Leon Battista Alberti (1404-1472) *De pictura*, Cristoforo Landino (1424-1498) *Formulario di epistole volgari*, Francesco di Giorgio Martini (1439-1501) *Trattato di architettura militare e civile*, Giovanni di Mandinilla, *Tractato delle più maravigliose cosse e più notabili*, Luca Pacioli, *De divina proportione*, and Giorgio Valla (1447-1500) *De expetendis et fugiendis rebus*, etc. Thus, even if Leonardo da Vinci's research works concern almost exclusively the fields he practiced as a technician, a need of a mathematical-geometrical[39] abstraction and of rationalization seems to emerge; apparently neglected until then by technicians, there was an exigency to define technique through observation and the mathematical explanation of phenomena. Nonetheless it is worth remarking that a consequence of this early form of *discontinuity* is the fact that Leonardo da Vinci's method surely did not spring out of nowhere. It is rooted in the scientific tradition of the Aristotelian school, further than in the Archimedean one. More specifically, many are the traces of Aristotle' thought to be found in Leonardo, starting with the concept that the knowledge of *universal things* (*the furthest from our senses*, *in contrast with the singular things which are the closest to our sensible perception*) is acquired by means of reasoning based on primitive truths that cannot be proved; the latter can be known by induction, that is by means of data of the sensible perception stored in our memory.

At the same time, Leonardo draws on Archimedes' *scientia*, in particular he shares the methodology based on the mathematical and geometrical study of the equilibrium that is he follows the rational criteria that the mathematician from Syracuse had set to determine the centres of gravity. Thus the relationship between Leonardo and the mathematics were influenced by many factors, especially his close friendship with Luca Pacioli. Nevertheless his results were enough immature with respect to the deep mathematical ideas born by Luca. In the following attempts by Leonardo to work with fractions before his meeting with Luca Pacioli is reported:

[Leonardo wrote]

"sarà $\frac{12}{12}$ cioè $\frac{1}{0}$ […]" " […] $1\frac{1}{12},1\frac{1}{2}$ […]"

[Then, he correctly transforms in "[…] $\frac{13}{12},\frac{7}{6},\frac{3}{2}$ […]"

[Now he sums these 3 fractions and obtains:] $\frac{216}{78}$

[Of course the result is wrong. The right one is

$$\frac{45}{12} \text{ that is } \frac{15}{4}$$

[He confused "12" as denominator. *Idem* ambiguous calculus are possible to read in the *Codex L*, f. 10v, f. 21v[40] and in the *Codex Atlantico*, f. 665r (Bagni & D'amore, 2007)].

Figure 9.
Rules to calculate fractions (da Vinci, *Codex Atlanticus*[41] f. 191v).

[37]Leonardo did not finish his speeches on *On the sky* (*Sul cielo*) and *On the world* (*Sul mondo*) would have to combine the researches of astronomy to those of geology. The few notes that there are often appear contradictory: on the one hand they show that Leonardo believed the Earth at the center of the system, on the other hand sometimes express concern about the motion of the Sun. In some passages only the comments around celestial bodies was then reduced to issues of lighting, within art and science speculations.

[38]See also: Aristotle, 1853, 1949, 1955a, 1955b, 1963, 1984, 1996, 1999; Cartelon.

[39]An interesting work on geometry during Islam period is Maitte, 2003.

[40]The *Codex L* is part of a set of manuscripts: *A*, *B*, *C*, *D*, *E*, *F*, *G*, *H*, *I*, *K*, *L*, *M*. They are archived at the Institute of France, Paris (France). They consist of twelve manuscripts, some bound in parchment, leather or cardboard. They have different sizes, the smaller one is the number M (10 × 7 cm), the larger one is C (31.5 × 22 cm). By convention each of them are named by a letter of the alphabet, from A to M (omitting J), for a total of 964 folia. The topics covers from military art, optics, geometry, hydraulic and flight of birds. A probably date might be fl. 1492-1516. Source: Istituto e Museo di Storia della Scienza, Firenze, Italy [via http://brunelleschi.imss.fi.it].

[41]The codex is the largest collection of Leonardo's sheets (end of the sixteenth century by the sculptor Pompeo Leoni (1531-1608) who dismembered many original notebooks. ca. 1478-1518 and consists of 1119 sheets. It is archived in *Biblioteca Ambrosiana* Milano, Italy and contains studies on science and technology, architectural projects, town planning, biographical records and personal notes. Source: Biblioteca Ambrosiana [via http://www.ambrosiana.eu].

On the Scientific Relationship between Leonardo and Luca

By considering the complexity and the huge literature on Pacioli's mathematics, before focusing on Pacioli-da Vinci scientific relationship, just few notes on Pacioli's arithmetical approach are reported.

The theory of proportions[42] plays a central role in the project of mathematization of knowledge proposed by Pacioli. It is interesting to remark the fifth[43] book of Euclid's *Elements*. It derived and commented by second part of the *VI Distinction* in the *Summa de arithmetica*, *geometria*, *proportioni et proporzionalità* (1494) where Pacioli claims his definitions of proportionality[44].

> If you well study, in all arts, you will found the proportion as the mother and queen of all of them, and without it you cannot exertion[45].

Figure 10.
Plate from *Summa* by Pacioli (Pacioli, *Summa*, f. 1r)[46].

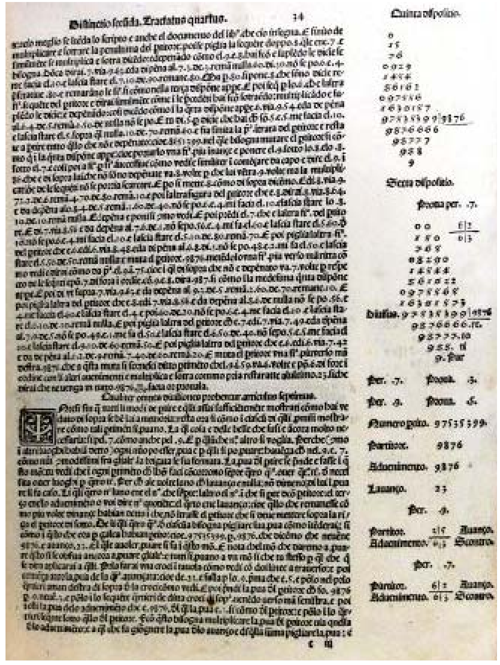
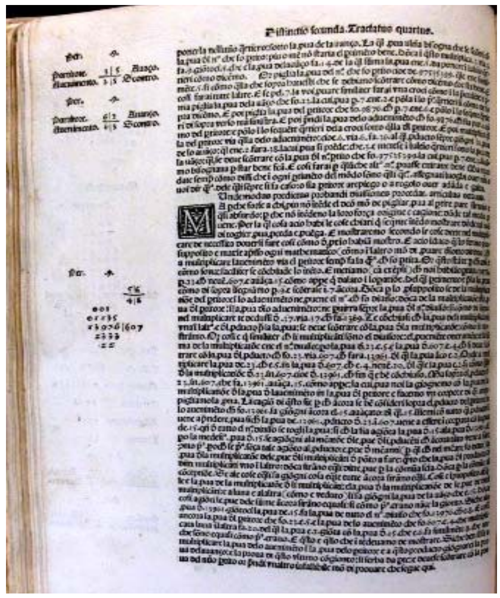


Figure 11.
Mathematical arguing in Pacioli's *Summa* (Pacioli, *Summa*, f. 34r)[47].



In a modern formalism. Given four proportional quantities

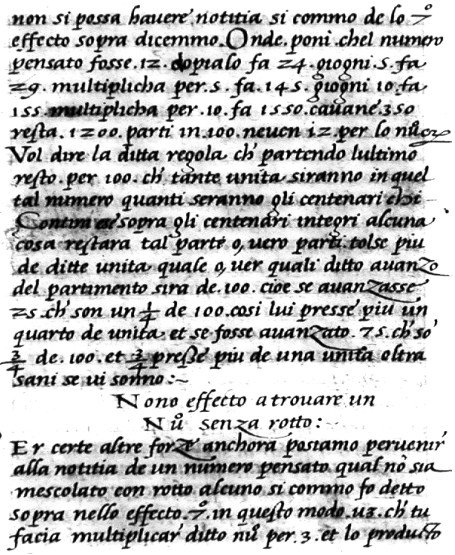
$$x:y = z:w$$

being m equimultiple of the first and third, and being n equimultiple for the second and fourth, one obtain:

$$ma = ny \text{ and } mz < nw$$
$$ma > ny \text{ and } mz = nw$$
$$ma > ny \text{ and } mz < nw$$
$$ma > ny \text{ and } mz > nw \text{ with } mx/ny > mz/nw$$
$$ma < ny \text{ and } mz < nw \text{ with } mx/ny < mz/nw$$

Figure 12.
Mathematical arguing in Pacioli's *Summa* (Pacioli, *Summa*, f. 34v)[48].

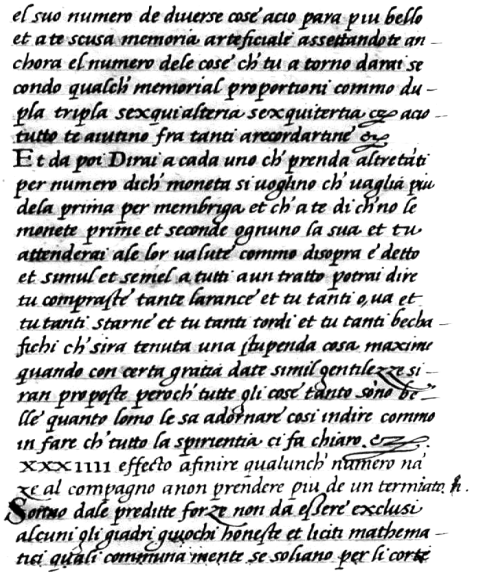
[42]Since the literature on Pacioli is very large, some examples and maybe more adequate arguments are reported only.
[43]In *vulgare* text by Federico Commandino (1509-1575) the definitions are: "[V, Def. 5] Magnitudes are said to be *in the same ratio*, the first to the second and the third to the fourth, when, if any equimultiples whatever are taken of the first and third, and any equimultiples whatever of the second and fourth, the former equimultiples alike exceed, are alike equal to, or alike fall short of, the latter equimultiples respectively taken in corresponding order […]. [V, Def. 6] Let magnitudes which have the same ratio be called *proportional*." (Commandino, 1575, Defs. 5-6; see also Commandino, 1565).
[44]"Dico con Euclide in quinto proportionalità in communi ene solo similitudine de più proportioni e al manco de doi" (Pacioli, *Summa*, 72v).
[45]Pacioli, *Summa*, 78v.
[46]Source: Max Planck Institute for the History of science– Echo/Archimedes Project [via http://echo.mpiwg-berlin.mpg.de/content/historymechanics/archimdesecho/archimedes-intro].
[47]Source: *Ibidem*.
[48]*Ibidem*.



Ninth effect for seeking a number without fraction [*rotto*]: [In modern language, given x, by using Fibonacci, we can calculate:] [...]

$$3\frac{\frac{3x}{2}}{9}=\frac{x}{4}$$

Figure 13.
On the fractions (Pacioli, *Viribus*, 20v, 21r)[49].



XXXIIII effect to finish whatever number is before the company, not taking more than a limiting number. [...] [For example two persons must reach 30 by summing alternatively numbers between 1 and 6. The one who reaches 30 wins. The artifice consists in making choice of the numbers 2, 9, 16, 23. Indeed, if I reach 23, as my opponent can only add a number between 1 and 6, he will reach at most 29 and I just have to add 1 to win. We find the other safe numbers with backward reasoning].

Figure 14.
On the recreational maths games (Pacioli, *Viribus*, 73v-74r)[50].

[49]Source: Biblioteca Universitaria di Bologna [via http://www.uriland.it/matematica/DeViribus].
[50]*Ibidem*.

With concern Leonardo, he wrote down earlier meeting with Pacioli, transcripts of his handful of whole passages of the Summa. On 10th November 1494, in Venice, finally released in print in Latin, Luca Pacioli's *Summa arithmetic*, *geometry*, *proportions et proportionality*. Luca inspired Leonardo, and he was counselor, teacher and translator. Leonardo bought *Summa* (119 *soldi*) as he claimed (da Vinci, *Codex Atlanticus*, f. 288r f. 104r, f. 331 r) and notes: "Learn multiplication of the roots by master Luca" (da Vinci, *Codice Atlanticus*, f. 331r [120r]). Thus, from 1496 to 1504 Leonardo studied Luca Pacioli's works and summarizes his theory of proportions (da Vinci, *Codex Madrid*, 8936). Based on that, he expressed his interest in geometry expressing both in the drawings for *De divina proportione* ([1496-98] 1509), that for his readings on Euclid (clearly only for first 6 books and part of the tenth. Leonardo faced the problem of irrational numbers, the ratio between incommensurable segments, side and diagonal of the square, the radius and the circumference and the problem of the so-called deaf roots (*radici sorde*).

Thus, after his meeting (1496) with Luca, Leonardo was busy in geometry and mechanics adopting new mathematical and geometrical assumptions forwarded by *Maestro* Luca. In the following examples on geometrical and mechanical problems are reported:

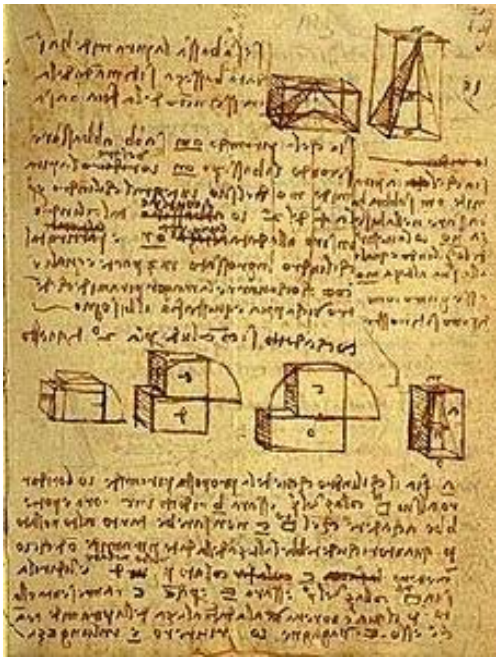


Figure 15.
Stereometric studies after Leonardo and Luca meeting[51] (da Vinci, *Codex Forster I*, f. 19r).

Particularly geometrical figures were presented for the first time in the *Codex Forster*[52] and finally included *De divina proportione* (1498) are evident examples.

[51]Source: Istituto e Museo di Storia della Scienza, Firenze, Italy [via http://brunelleschi.imss.fi.it].
[52]This *Codex Forster* is composed of two manuscripts totalling 159 leaves. The Ms. I (1497) presents studies of mechanics, ornamental knots and plaits and of architecture. The Ms II (1495) records Leonardo's research in physics and mechanics (force, gravity, weight and movement). Particularly the *Codex Forster I* from f. 14r to f. 22r includes speeches on *Summa*'s theory.

Generally speaking, Leonardo tried to develop a process of theoretical and experimental research (Rogers) that starts from tasks and requirements of a practical nature and then develops theoretical considerations, compared with the classical and medieval primary sources of scientific knowledge, to be verified experimentally, in order to build up general mathematical rules applicable to specific cases. Particularly he used pragmatic and realistic approach to the mathematical problems. Leonardo does not seek absolute rigour in the results of his research, but an approximation recognized as useful, clearly an attempt to rationalize all human activities, including his own (Pisano, 2009; Pisano & Rougetet, 2013).

With Leonardo, it very often recurs, perhaps for the first time, the idea of an absolutely efficient *building-machine* (Pedretti, 1978, 1999). Within it daily activities are made rational and mechanic: e.g. a fireplace automatically operated, a laundry, the model of a stable. The building is conceived as a *living organism* but, at the same time, in a sense, taking Vitruvio' concepts to the extreme, he suggests also the way round. In other words, living organisms too—men and animals—are turned into *machines*. In this sense, he detects in any organism, living or not, a unity of process and function based on movement and considers animals as a human body and buildings as a whole of mechanical devices, that he calls *elementi macchinali* (*machineries*) *Bird is a device performing after a mathematical law and nature cannot make animals move without mechanical devices* Leonardo da Vinci's considerations around such *mechanical elements* and his studies of anatomy are really interesting, proving study and performance methods very similar. This *uniformity of treatment* emerges in his drawings as well, either anatomic, where bones and muscles are handled as geometrical schemes of *ingegni*[53], or of machines and tools, in which relevant specific elements insist, such as the cannons-columns[54] that seem to claim the universality of the planning project. Thus, it is evident that the studies by Leonardo represent an important and partly correct attempt to formulate a general theoretical organization involving greater formalization—than his predecessors—which can clear up and preview, e.g. the deformability of bodies in mechanics and architecture. One of his aims was to avoid further planning mistakes to ensure the proper functioning of the *building-human organism* and of the *building-machine*[55].

Unlike Leonardo, Luca implemented an *artimetization* of the theory of proportions (Pacioli's Summa, 77-78rv) which is based on the *Book V*, and above based on the *Book VII* (the first of the three arithmetic books of the *Elements*) that provided to use the proportions in practical scope of the calculation, and using the concept of *denominator*. The subject of the proportions is the core of the scientific program of *mathematization* pursued by Luca. The latter adopted a practice to use ratio by the denominators, since he frequently adopted Euclidean definitions of in the seventh book of the *Elements*, equivalently of practice use adopted at that time by non mathematicians, that is by philosophers. At that stage he uses which the selected list of names as presented in the *Arbor proportionis*.

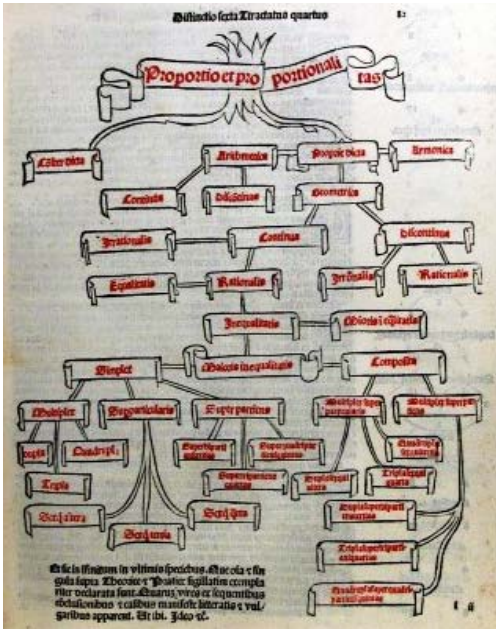


Figure 16.
The *Arbor proportionis et proportionalitatis* by Pacioli (Pacioli, *Summa*, f. 82r).

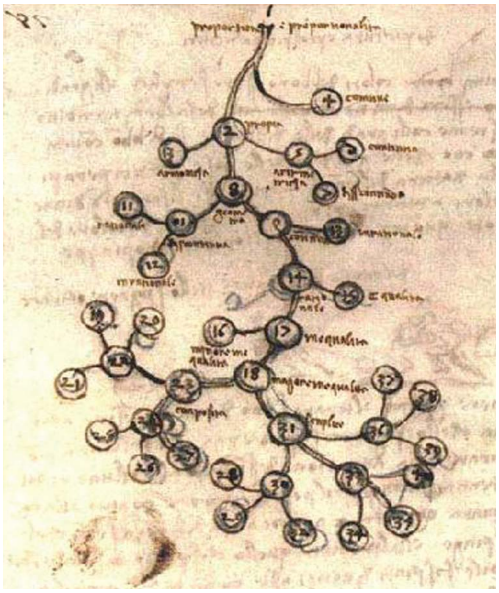


Figure 17.
The *Arbor proportionis et proportionalitatis* by Leonardo (adapted by Pacioli's *Arbor*) (da Vinci, *Codex Madrid*, Ms. II, f. 78r)[56].

[53]da Vinci, *Codex Windsor*, RL 12656; see also f. 17r.
[54]da Vinci, *Codex Atlanticus*, f. 28v.
[55]In this way he is remote from his contemporaries. Later, toward the end of the Renaissance this new way to decide the theory that assumed a particular cultural value mainly proceeding towards an *analytical* perspective of conceiving mechanics that seemed to be coming to a crossroads: *physical or mathematical science*? That way another historiographic problem emerges (Pisano, 2009; Pisano & Gaudiello, 2009): a crucial continuity-discontinuity problem appears when a theory is included in another theory, e.g. mathematics in mechanics (*rational mechanics*), astronomy in mechanics (*celestial mechanics*) mathematics in thermodynamics (analytical theory of heat), mechanics in engineering (*structural mechanics*).

[56]The *Codex Madrid* is a recent Codex rediscovered in 1966 consists of 157 folia concerning Leonardo's activity in Firenze on plans for military architecture carried out (Piombino), maps of the Tuscan region, notes on painting and studies of optics. A final booklet, arbitrarily attached to the manuscript, contains Leonardo's studies (1491-1493) for the casting of the equestrian monument to Francesco Sforza.

Leonardo is interested in Pacioli's works and reported it his three codes (da Vinci, *Madrid II*, *Forster II* (1˚); *Id*., *Ms. K*. The *Codex Madrid II* (da Vinci, *Codex Madrid II*, Ms. 8936), contains from folio 46v to folio 50r, a summary of the *Sixth distinction* of the Pacioli's *Summa*, dedicated to the proportions and proportionality. In fact, the *Codex Forster II* (1˚), by folio 14r to folio 22r contains notes on the theory of proportions that lead back to the *Summa*. Finally in the *Ms. K* (da Vinci, *Ms. K*), dotted by numerous references to the propositions of Euclid's Elements (*Book V*), one can read:

> The proportion is not only to be found in numbers and measures, but also in sounds, weights, intervals of time, and in every active force in existence[57].

The sentences belongs to *Summa* by Pacioli (Pacioli, *Summa*, f. 69r) which in turn, he belongs to the comment by Campano adapted for his Euclidean work (Pacioli, *Euclidis*, f. 32rv-33r). With regard to the geometry, Leonardo was interested in construction of regular polygons with ruler and compass, rather that problems of constructing a square sum of two data. On can see, e.g., the problem by dividing the circumference in 3, 4, 5, 6, 7, 8 equal parts up to the maximum of 48 sides (da Vinci *Codex Atlanticus*, f. 11v). The speech are randomly distributed in the manuscripts where few precise explanations are proposed by Leonardo only adding by *ragione* (*reasoning*, a sort of proof). In effect they are not really proofs, rather they are fast explanations (da Vinci, *Codex Forster III*, fs. 68v-69r).

Final Remarks

Finally, Leonardo met Luca in Milan (1496). The friendship and mutual respect between the two are very strong as Pacioli wrote in the first pages of *De divina proportione* around a scientific challenge (*duello scientifico*) that took place at the court of Ludovico il Moro on the February 9, 1498, (clergy, theologians, doctors, engineers and inventors of new things and Leonardo shared it). Leonardo learnt concepts, methods, proofs and *avversaria* for the statement to refute (*inimica*). The geometry of Leonardo is therefore more cultured, and obtained by Pacioli (and indirectly by Euclid). In particular, golden section presented to him by Luca, who calls it *Divine proportione*.

Very known are the drawings of Leonardo in the divine proportion by Luca so I avoided to be reported.

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Reclaiming Realism for the Left: Gar Alperovitz and the Decision to Use the Atomic Bomb

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Sixty-seven years after the decision to use the atomic bomb in World War II, controversy remains whether the United States was justified in using fission bombs in combat. Gar Alperovitz, the great revisionist historian, in his *Atomic Diplomacy* and *The Decision to Use the Atomic Bomb* transformed our knowledge of the geopolitical motives behind the atomic attack against Japan at the end of World War II. These uranium and plutonium-core bombs were political, not primarily military in purpose and motive behind their deployment. His analysis will be compared to realists such as Hans Morgenthau, Kenneth Waltz, Henry Kissinger and George Kennan who for the most part questioned unrestrained violence and offered nuanced views on the wisdom of using such indiscriminate, savage weapons of war. The paper will explore Alperovitz's classic argument that out of the ashes of Hiroshima and Nagasaki, the A-bomb drove the incipient Cold War conflict. American national-security elites construed the bomb as a political-diplomatic lever to contain Soviet power as much as a military weapon to subdue Japan. The views of various political and military leaders, President Truman, Henry Stimson, James Byrnes, General George C. Marshall, Admiral William Leahy and General Dwight Eisenhower are assessed.

Keywords: A-Bomb; Alperovitz; Realism; Hiroshima; Truman

Realism and War

At 8:15 in the morning on August 6, 1945 the world changed forever when the United States launched the nuclear age with an air-burst atomic bomb that exploded in the skies over Hiroshima, Japan. The city-busting carnage was repeated on August 9 with the destruction of Nagasaki in the final days of World War II. The cataclysmic potential for mass destruction of humankind had not occurred on such a scale since the Columbian invasions and subsequent extermination of the Native American settlements beginning in the late fifteenth century (Crosby, 1987). The decision to use the atomic bomb raises questions ranging from its impact on international peace and security to whether the atomic bomb advanced the national interest.

Realism does not worship the use of force in all circumstances. Examples of realism shall be examined that explore with nuance in theory and direct examination the use of the A-bomb against a conventionally armed Japan. Realism emphasizes the use of power in pursuit of the national interest in a world of anarchy. Alperovitz's writings investigate many dimensions that are relevant to the realist critique that begin to emerge in Thucydides's epic history of the Peloponnesian War in the fifth century B.C.E.

Athens informed the Lacedæmonians in speeches before their assembly that they must submit to Athens' greater power and avoid rhetorical efforts to prevent domination. They are told that "the secret being that where force can be used, law is not needed." Thucydides, anticipating the anarchy of realism that requires a muscular approach in defending the national interest, quotes the Athenians, "that the weaker must give way to the stronger" (Thucydides, 1951). The militarily dominant Athenians, in their war against Sparta, subdue the neutral islanders of Melos who had complained they were "debar(red) from talking about justice and invite us to obey your interest" (Thucydides, 1951). Neither conditional surrender nor negotiation were permitted: surrender or die was the Athenian option.

The pursuit of the national interest by war and rejecting non-violent conflict resolution is morally repugnant. Pope Paul VI in his "World Day of Peace Message in 1976", described the atomic bombings of Hiroshima and Nagasaki as a "butchery of untold magnitude" (National Conference of Catholic Bishops, 1983). Atomic bombs are indiscriminate. They kill babies, fathers, mothers, brothers, sisters, children, hospital patients, doctors, trees and gardens. Classmates, books, animals in zoos, life savings, sidewalks, engagements, marriages, and highways are destroyed (Sebald, 2003).

It is instructive to apply America's launching of nuclear war to realism and its variants that developed between the wars and subsequently during the Cold War between the United States and the Soviet Union. Realism is not a monolithic ideology and one may glean a broad spectrum of analysis that can be applied as a counter argument against the decision to use the atomic bomb at the end of World War II.

E. H. Carr was an anti-imperial, Marxist historian whose works on modern Russian history may endure as long as those

in the realm of international-relations theory (Ghosh, 2007). He was one of the early forerunners of classical realism and skeptical of a universality of moral principles that should govern humankind. His between the wars critique of Wilsonianism, a favorite target of realists determined to challenge lofty headed idealism, was less than absolute. While various critics described Carr's "scathing critique" of idealism, the "harmony of interests," and the search for a comprehensive moral code of justice, his writings are almost lyrical in their denunciation of the indiscriminate use of force unrelated to military necessity (Snow, 2000).

While Carr remains faithful to the tradition of classical realism that the pursuit of power and not international moral principles is essential for nation-state survival, he rejects the use of military force if arbitrarily and indiscriminately destructive. Carr's distinct manifestation of idealism emerges from the realist:

> All agree that there is an international moral code binding on states. One of the most important and most clearly recognised items in this code is the obligation not to inflict *unnecessary* death or suffering on other human beings… This is the foundation of most of the rules of war, the earliest and most developed chapter of international law (Carr, 1961).

Carr and Irving Critique

In a footnote, Carr observes with some conditionality that following World War I, modern warfare has blurred the distinction between combatant and non-combatant immunity. While attacking the latter might be "essential to... military purpose," Carr does not sanction a reckless or murderous disregard of avoiding non-combatant carnage in war (Carr, 1961). During World War II there was mass scale horrific destruction of non-combatant populations. Strategic bombing killed one and a half million civilians in urban areas across the globe including Dresden, Cologne, Hamburg, Tokyo, Osaka, Yokohama, and London (Simic, 2003). As the violence mounted in a war without mercy, nations waged total war upon defenseless, non-combatant populations that were targeted along with military bases, armies in the field, and key naval staging areas. One's status had no bearing on whether a person would be targeted; only one's distance from a conventional or nuclear explosion would determine life or death (Rhodes, 2007). Even Secretary of War Henry Stimson's removal of Kyoto from the nuclear-target list was intended to preserve the ancient capital's historic treasures but not its population (Carr, 1961).

If nation states reject any obligation to accept international regimes, according to Carr, than international morality is impossible (Carr, 1961). Yet nations that attempt to universalize their values are equally repugnant. Carr compares nations that claim a universality of their principles to Hitler's assertion that Germany and the fittest are "the bearers of a higher ethic". Clearly referring to Wilsonian hubris, he eloquently denounces the bombast "that American principles are the principles of humanity" (Carr, 1961). Carr advocated some adherence to international norms but not if it rested on nationalistic fervor emanating from hegemonic ethnocentrism (Carr, 1961).

David Irving wrote in the opening sentence of *Hitler's War*: "To Historians is granted a talent even the gods are denied—to alter what has already happened!" (Irving, 1990). In addition to historians, nation-states and other ruling elites have unwarranted influence in selecting and defining the components of public memory. Race, class, and gender are powerful factors in determining whose history gets written, whose history is memorialized in museum display, and whose history is deemed important or relegated as nonhistory. While everything in the past is history, the historical record includes what influential elites—the press, the fawning professor-academic class, various ethnic groups, the government and the media—believe can advance their interests. Dominant groups control history by controlling the present and thus memory of a civilization.

Revisionism and the A-Bomb

Gar Alperovitz in his major revisionist works, *Atomic Diplomacy*: *Hiroshima and Potsdam, the Use of the Atomic Bomb and the American Confrontation with Soviet Power* and *The Decision to Use the Atomic Bomb* avoids directly the moral question of whether the atomic bomb was justified as a weapon of war (Alperovitz, 1985, 1995). Yet his stunning analysis of transformative revisionist history argues convincingly that the Truman administration's decision to use the atomic bomb at the end of World War II was not militarily needed to defeat Japan and that the standard defense of the bomb's use is egregiously flawed.

Alperovitz has created a new past in challenging the architects of the atomic era and those who dominated its historical significance. His magisterial writings that appear in books and essays contain five major revelations: 1) In the months before the A-bombs were unleashed in August, 1945, the United States had several viable options to end the war without resorting to weapons of mass destruction; 2) These options were not created in postwar-revisionist New Left history but were known at the time at the highest levels of government. In particular, Japan was looking for a way to end the war and retain its emperor through intense diplomacy with Russia; 3) The atomic bomb was essentially a diplomatic weapon to contain and even roll back Soviet influence in Central and Eastern Europe in the early days of the Cold War (Alperovitz, 1985); 4) The weapons' principal military purpose was not to defeat an already defeated Japan, but to preempt greater Soviet influence in Asia that might result from a protracted, sustained role after it entered the Pacific War; 5) The atomic bomb was not necessary to defeat Japan or prevent a high-casualty invasion of its home islands (Alperovitz, 1985).

Manhattan Project and Targeting

The Joint Chiefs of Staff initially ordered that Hiroshima, Kyoto, Kokura, and Niigata escape conventional bombing to preserve pristine targets to measure and admire the destruction of atomic bombs. (Correspondence ("Top Secret") of the Manhattan Engineer District, 1945) Hiroshima and ultimately Nagasaki became urban-atomic experiments because conventional bombing had not reduced them to ashes. Major General Leslie R. Groves, the director of the Manhattan Project, ordered a post-attack assessment report. The report confirmed Hiroshima was chosen since it was "relatively untouched by previous bombing, in order that the effect of a single atomic-bomb could be determined" (Manhattan Engineer District, No Date). This was a strong indication that Hiroshima was not considered a high-value strategic military target.

While the Manhattan Project report stated atomic targets should have "high military strategic value," it was ignored with the indiscriminate atomic bombings of urban populations. The report emphasized that the A-bomb should have a "morale effect upon the enemy" (Manhattan Engineer District, No Date). It affirmed an advantage of fission weapons is the "sheer terror it struck into the people of the bombed cities," and "terror resulted in immediate hysterical activity" including "flight from the cities" (Manhattan Engineer District, No Date). Fission is a term borrowed from biological cell division and refers to the neutron splitting of a uranium or plutonium nucleus into two smaller and similar sized nuclei.

Clearly, the decision to use the atomic bomb was not to reduce Japan's capacity to wage war as two cities were marked for destruction because of revenge, racism, and a desire to field test these new weapons of mass destruction (Dover, 1986; Takaki, 1985). President Harry S. Truman's diary during the Potsdam Conference contained this entry: "The Japs are savages, ruthless, merciless and fanatic" (Bernstein, 1991). Many more targets were planned. One-hundred thousand persons had already been incinerated in fire-bomb raids of Tokyo during a single night in March, 1945 (Freedman, 2007). Because Tokyo was of "great psychological value," Thomas Farrell, deputy commanding general and chief of field operations of the Manhattan Project, urged its nuclear annihilation when more fission bombs became available (Farrell, 1945). On one level it was an inevitable escalation of conventional-strategic bombing.

The Target Committee meeting on April 27, 1945 had declared that the 20th Air Force conventional bombing of urban areas had "the prime purpose in mind of not leaving one stone lying on another" (Correspondence ("Top Secret") of the Manhattan Engineer District, 1945). Philip Morrison was one of several Manhattan Project nuclear physicists and engineers on Tinian who loaded the "Fat Man" Nagasaki implosion-triggered plutonium A-bomb onto *Bockscar*. This was the B-29 Stratofortress that carried the weapon to the skies over Nagasaki with the eponymous reference to Captain Frederick C. Bock. Ironically he switched aircraft just prior to takeoff and Major Charles Sweeney was at the controls of *Bockscar* (Rhodes, 1986). Morrison after the war reflected: "But I wondered: Is this the right thing to do… We knew a terrible thing had been unleashed… We obviously killed a hundred thousand people and that was nothing to have a party about… This would reduce a city of three hundred to four hundred thousand people to nothing but a sink for disaster relief, bandages and hospitals" (Terkel, 1984).

Realism's Approach to War

Realism's concern that worldwide anarchy requires a unilateralist pursuit of its national interest is not absolute. Realism is seen as rejecting economic, social, and human-rights violations in third countries as germane in developing a nation's strategic approach to foreign policy. Pragmatists tell us that realism is disciplined with a focus on limiting American foreign policy to pursuing the national interest through the use of power (Haas, 1997). While clearly less committed than internationalists or pacifists to defining how power might be used or enforcing the laws of war, its founding intellectuals questioned the ethics of atomic war at the beginning of the nuclear age.

Reinhold Niebuhr, the influential, realist theologian, drifted from Marxism to realism during his great career as a public intellectual. Such ideological musings are evident in his *Moral Man and Immoral Society*. Niebuhr alternated between opposition and support of various nuclear policies during the Cold War. He opposed publicly the dropping of the atomic bombs on Hiroshima and Nagasaki and was a signatory of a Federal Council of Churches statement that opposed the atomic detonations over Japan. James B. Conant was president at Harvard on leave during the war when he served as chair of the National Defense Research Committee. He was a major architect of the Manhattan Project and served on the pivotal Interim Policy Committee on Atomic Energy (Interim Committee). He complained to Niebuhr about his support of the anti-nuclear bomb petition and received an ambivalent apology that stated the atomic weapons were "evil… in order to do good" (Lears, 2012; Kirstein, 2009).

Hans Morgenthau attacked the hypocrisy of the Roosevelt administration's condemnation of indiscriminate warfare resulting from Japan's attack on Canton and Russia's assault on Finland in the 1930s when the United States and others perpetrated far more ruthless strategic bombing during World War II. He places the atomic attacks as the culmination of the progression toward total war:

> Hiroshima and Nagasaki are stepping stones… in the modern morality of warfare… The national interest in the destruction of enemy productivity… and the opportunity the modern technology presents of satisfying that interest, have had a deteriorating effect upon international morality (Morgenthau, 1985).

Contrast this analysis with Herman Kahn's graduated deterrence and the escalation-dominance catechism that would drive nuclear war-gaming scenarios during the Cold War. Morgenthau ruefully predicted that the incorporation of nuclear weapons as "normal instruments of warfare would mean the destruction of… viable societies." To construe their utility as a super weapon that can decisively determine the outcome of war "would not be a rational means to the rational ends of foreign policy but instruments of desperation denoting suicide and genocide" (Morgenthau, 1985).

A-Bomb and Diplomacy

Avoiding a final invasion of Japan and the myth of saving a million American casualties have been the most enduring defense of the decision to use the atomic bomb. The preliminary invasion, Operation Olympic, was not scheduled to begin until November 1, 1945 on the southern island of Kyushu. The full-scale Operation Coronet invasion across the Tokyo Plain would not commence until March 1, 1946, almost seven months after the Hiroshima bombing (Alperovitz, 1985). Other military or diplomatic options could have been pursued during the intervening period. Alperovitz believes the United States hastily used the bombs just before and after the Soviet Union decided to end its neutrality in the Pacific War.

The US deployed the atomic bombs not as a winning weapon but as a preemptive nuclear war to deter Soviet influence in Manchuria and Japan (Alperovitz, 1985). Months before the Olympic and Coronet ground invasions would occur, the United States dropped uranium and plutonium-core nuclear weapons over Japan. It was a geopolitical decision to effectuate a strategic advantage over the Soviet Union in America's expanding Northeast Asian empire, dominate the peace in occu-

pied Japan, and strengthen its yet to be named "containment" policy in Eastern Europe.

At the Moscow Foreign Ministers Conference in October 1943, almost two years before the Manhattan Project would produce combat-ready nuclear weapons, the Roosevelt administration pressured the Soviets, then engulfed in epic conflict with the Wehrmacht and sustaining the majority of the war's casualties, to enter the Pacific War (Alperovitz, 1985; Baker, 1976). Joseph Stalin was more preoccupied with national survival after the Nazi "Barbarossa" invasion of June 22, 1941, but agreed with Hitler's defeat in sight at the Yalta Crimea Conference in February, 1945 to terminate its state of non-belligerency with Japan. Russia would end its state of neutrality with Japan within two to three months after its defeat of German forces. It surrendered on May 8 and, ninety-two days later on August 8, Russia invaded Japanese-occupied Manchuria from its bases in Siberia. The Truman administration chose not to allow the impact of the devastating loss of Russian non-belligerency to register fully with Japan. It was fighting alone without an ally in what was suddenly a conflict against the two greatest powers on Earth. Truman also chose not to allow Japan ample time to comprehend its atomic vulnerabilities following the "Little Boy" Hiroshima attack (Horowitz, 1971). The day after the Soviet Union initiated its Yalta pledge to enter the war and three days after the first atomic bombing, "Fat Man" destroyed Nagasaki.

Truman postponed the Potsdam Conference that was held in a suburb outside bomb-ravaged Berlin during the summer of 1945 hoping that a nuclear test might allow a unilateralist approach in dominating post-war Japan (Alperovitz, 1985). The conference began July 17 the day after the successful atomic-bomb "Gadget" explosion at the Trinity site in New Mexico. Truman wanted confirmation that the A-bomb worked before suddenly reversing long-term American policy that ending the Pacific War required a Soviet-American coalition (Alperovitz, 1970). The "Little Boy" gun assembly, uranium Hiroshima bomb was then shipped to Tinian in the Marianas as Truman anticipated a nuclear ending to World War II would preempt a sustained Russian entry into the war. The 1945 Russo-Japanese conflict was a six-day war from August 8 to August 14 when Emperor Hirohito announced a surrender.

Russia and the Bomb

James Byrnes, Truman's personal representative on the Interim Committee, dominated policy formulation on how and not whether the atomic bomb would be used. Byrnes becomes secretary of state in July while still serving on the Interim Committee. Army Chief of Staff General George C. Marshall, in the spirit of allied transparency, suggested at a May 31, 1945 Interim Committee meeting that two Russian scientists attend the New Mexico A-bomb test and observe its unprecedented power. Byrnes rejected any sharing of information with the Soviets on S-1, the codename for the Manhattan Project (Correspondence ("Top Secret") of the Manhattan Engineer District, 1945).

After Trinity, British Prime Minister Winston Churchill endorsed the American abandonment that urged Russian entry into the Pacific War: "we should not need the Russians" and "European problems" would be more manageable with a "far happier prospect in Europe" (Churchill, 1953). Cold War power-maximizing thinking took precedence over preserving the solidarity of the wartime alliance. Nuclear weapons were the great equalizer that would preempt Russian influence in post-war Japan and manage its domination of Red Army liberated Central and Eastern Europe. P. M. S. Blackett's classic observation stated, "the dropping of the atomic bomb was not so much the last military act of the Second World War, as the first major operation of the cold diplomatic war with Russia" (Steiner, 1977).

At Potsdam there was a brief exchange when Truman obliquely informed Stalin that the United States had developed a new weapon against Japan. The words "atomic" and "nuclear" were not used (Alperovitz, 1985). Henry Kissinger a realist scholar-statesperson stunningly states that Truman revealed to Stalin "the existence of the atomic bomb" (Kissinger, 1994). Kissinger without documentation claims that "undoubtedly" Stalin's "paranoia" induced the Soviet leader to construe this atomic revelation as "intimidation" (Kissinger, 1994). Kissinger's depiction of the exchange contrasts sharply with that of Churchill who observed intently the Truman-Stalin conversation from a distance of five yards. Churchill described Stalin as "delighted" but "had no idea of the significance" of Truman's vague reference to a more destructive weapon (Churchill, 1953).

The prime minister and Truman agreed they no longer "needed" Soviet intervention in the Pacific War. Two days after the July 16 plutonium A-bomb test in a New Mexico desert, Churchill composed a note for his War Cabinet that Truman told Stalin only "the simple fact" of a new weapon but "at all costs refused to divulge any particulars" (Churchill, 1981). Truman told Churchill after the July 24 conversation with Stalin that he asked no questions and Churchill believed had "no special knowledge of the" atomic bomb (Churchill, 1981). Unlike the expansive Churchill, the laconic Truman devotes a mere three sentences in his memoirs on his encounter with Stalin. Yet he confirms a "casually" delivered account of a "new weapon of unusual destructive force" and corroborates Churchill's observation that the Soviet leader appeared pleased (Truman, 1951).

Kissinger makes another speculative but interesting assertion that Stalin knew about the existence of S-1 before Truman did (Kissinger, 1994). Stalin probably was aware of the Manhattan Project based on Soviet intelligence prior to Secretary of War Henry Stimson's comprehensive April 25 S-1 briefing of the new president after the death of Franklin Roosevelt (Harrison-Bundy Files, 1942-1946). F. D. R. was aware of likely Soviet intelligence assets during the developmental stage of the atomic bomb. Stimson had alerted Roosevelt as early as September, 1943 of its wartime ally's penetration of the Manhattan Engineer District (Sherwin, 1973). Yet Stalin had little conception of the atomic bombs' magnitude of scale before the attacks on Hiroshima and Nagasaki (Patterson, 2000). Kissinger's air of authority that Stalin was fully informed about the atomic bomb through a combination of espionage and Truman's alleged atomic revelation at Potsdam is highly speculative. He ignores the Anglo-American determination to retain indefinitely an atomic monopoly as the Grand Alliance was beginning to unravel with Cold War division and competing imperial overstretch. The ethnocentric belief that the Russians were not capable of developing an atomic bomb for several decades fed the arrogance of atomic monopoly amidst a world of inferior technological actors (Sherwin, 1975).

Kissinger avoids any citation of Alperovitz's work and relies

instead upon counter-revisionist scholars such as John Lewis Gaddis. While presenting himself as a Metternichian acolyte committed to realism and pragmatism in external affairs, Kissinger actually confirms Alperovitz's revelation that the A-bomb's use was intended in large measure to intimidate the Russians into accepting containment and America's technological mastery in the postwar period. Kissinger supported Byrnes's objective to use American atomic might to pressure the Soviet Union to embrace free elections in Poland and throughout Eastern Europe (Maier, 1978; Alperovitz & Messer, 1991-1992; Bernstein, 1991). The "awesome power of the atom bomb… would have strengthened the American bargaining position" (Kissinger, 1994). Kissinger laments the failure of Byrnes's atomic diplomacy to control Soviet behavior yet strikingly avoids any lamentation much less referencing of the atomic bomb's impact on the citizens of Hiroshima and Nagasaki.

Military Leaders and A-Bomb

Classical realism emphasizes "the central role of power, the primacy of national interest, and the pervasiveness of conflict" (Spanier & Hook, 1998). Military leaders orchestrate the use of power in war. They are intimately involved in decision making as it pertains to strategy and tactics. They literally defend the putative national interest and participate in defining it. In World War II, senior military officials were widely respected and admired. General Dwight Eisenhower would follow Truman as the thirty-fourth president and General George C. Marshall would serve as secretary of state and defense.

Opposition to a unilateral nuclear war was not limited to liberal-internationalist scientists working at the Metallurgical Laboratory (Metlab) of the University of Chicago (Kirstein, 2001). Alperovitz demonstrates that many senior military leaders opposed abandoning conventional warfare in the final days of World War II. Eisenhower told Stimson before the nuclear assaults that "he had a feeling of depression… that dropping the bomb was completely unnecessary… as a measure to save American lives" (Alperovitz, 1970). Eisenhower later proclaimed, "It wasn't necessary to hit them with that awful thing" (Alperovitz, 2011). In March 1945, General Curtis LeMay directed B-29 indiscriminate, low-altitude, nighttime burnings of some sixty-three Japanese cities prior to Hiroshima. He declared after Japan's surrender: "The war would have been over in two weeks… The atomic bomb had nothing to do with the end of the war at all" (Alperovitz , 2011). Admiral William D. Leahy was the nation's senior military officer serving as chair of the Joint Chiefs of Staff and chief of staff to Truman. He "believed war is not to be waged on women and children." Leahy stated "they went ahead and killed as many women and children as they could which was just what they wanted all the time." Elsewhere in his memoirs he refers to the atomic attacks as "barbarous" (Alperovitz, 1985, 1995).

Arguments over Bomb Use

Truman's declared revenge was a motive in his announcement of the bombing of Hiroshima: "the war from the air at Pearl Harbor… has been repaid many fold." Yet the "Little Boy" bomb was a nuclear Pearl Harbor with a sneak attack on an unsuspecting nation (Harrison-Bundy Files, 1945). While Pearl Harbor was horrific and tragic, it was tactical and directed against battleships and airplanes. Supporters of the decision to use the A-bomb dismiss the necessity of announcing the existence of the weapon prior to attack; Japan deserved no sparing of suffering that American technological prowess might deliver. Advocates of an atomic warning believed it was a moral imperative prior to atomic ruin. No atomic warning was contained within the Potsdam Declaration that Truman, Churchill, and nationalist China Generalissimo Chiang Kai-shek signed on July 26, 1945. The exclusion of Russia from signing the declaration was a clear signal to Stalin that the United States was attempting now to bypass previous entreaties to enter the war. The use of the atomic bombs without warning to Japan or Russia indicate the desire on the part of the United States to contain Soviet power in Asia (Hasegawa, 109).

Morrison also witnessed the plutonium-gadget test at Trinity in the appropriately named desert, Jornada del Muerto (Journey of Death). In a postwar interview he said: "I was of the opinion that a warning to the Japanese might work. I was disappointed when the military said you don't warn… Now, of course, I don't think the bombing was justified" (Terkel, 1984).

Probomb advocates also opposed a non-lethal demonstration, as Marshall advocated, for fear it might be a dud or if conducted in Japan, American POW might be brought into a pre-announced ground-zero site (Steiner, 1977). The Truman administration rejected a demonstration of the atomic bomb off Tokyo bay, in the United States, or in some sparsely populated area to stun Japan into surrender. Several scientists from Metlab issued the Franck Report on June 11, 1945, which recommended a demonstration on a "desert or a barren island" to forestall widespread "horror and revulsion" (Kirstein, 2001). Physicist Edward Teller, a strong supporter of nuclear weapons and a major figure in the development of the hydrogen bomb, noted in his memoirs that a demonstration over Tokyo Bay might have convinced Japan that ending the war was necessary for its survival (Teller, 2001).

Japan was defenseless. American naval assets surrounded and effectuated a "strangling blockade" of Japan (Stimson, 1947). The war of burning cities had reduced the nation to rubble. Its navy was virtually destroyed and air force and air defense incapable of retarding attack. Truman and Byrnes, however, opposed any modification of unconditional surrender terms that would allow Japan to retain its emperor in exchange for surrender. Japan's emperor was considered a deity and the incarnation of perfection. The evidence, while not conclusive, strongly suggests a Japanese surrender prior to Hiroshima if guaranteed the preservation of its monarchy (Alperovitz, 1995). Alperovitz demonstrates American intelligence in breaking the Japanese code was privy to its frantic démarche with Russia to conclude a mediated settlement of the war with the preservation of the chrysanthemum throne. Only Byrnes among senior civilian officials rejected outright any modification of unconditional surrender that Roosevelt had declared in an almost impromptu manner at a press conference during the first allied-war conference at Casablanca in January 1943 (Alperovitz, 1995).

Truman's rejection of conditional surrender through diplomacy prevented a possible shortening of the war without the introduction of nuclear weapons (Sherwin, 1975). If a belligerent believes that surrendering could have the most egregious consequences for state survival, there are no inducements to end the fighting other than abject surrender to a more technologically advanced and remorseless enemy. After Japan's surrender the United States preserved the emperor within the framework of a constitutional monarchy (Alperovitz, 1995).

The use of the A-bomb and the Soviet decision to intervene occurred at virtually the same time. August 6 and 9 were the fateful days of Hiroshima and Nagasaki and the Soviet Union attacked Manchuria on August 8. Yet Alperovitz believes it was the Soviet entrance into the war that was the decisive event leading to Japan's surrender. The Russian declaration of war was a crushing failure for Japanese diplomacy and that alone might have ended the war. Emperor Hirohito informed senior Army officers and soldiers on August 14, the day he declared surrender, that "The military situation has changed suddenly. The Soviet Union entered the war against us… Now that the Soviet Union has entered the war, to continue under the present condition… would only result in further useless damage… Therefore … I am going to make peace" (Alperovitz, 2011).

Defenders of the decision to use the atomic bomb claim it hastened the end of the conflict and was responsible for sparing over a million American and Japanese lives. Numerous documents and Alperovitz's revisionist history suggest strongly the decision to use the atomic bomb did not shorten the war. The United States Strategic Bombing Survey stunningly concluded in July 1946, "that certainly prior to December 31, 1945, and in all probability prior to November 1, 1945, Japan would have surrendered even if the atomic bombs had not been dropped, even if Russia had not entered the war, and even if no invasion had been planned or contemplated" (Feis, 1970). It concluded the "atomic bombs did not defeat Japan" (Bernstein, 1976).

Supporters of the decision to use the atomic bomb assert that the horrific atomic ending of World War II served notice that nuclear war was too dangerous and has deterred subsequent use of these weapons. Opponents of the bombing of Hiroshima and Nagasaki claim it launched a nuclear arms race. America's nuclear ending of World War II created even greater international instability with vertical and horizontal nuclear proliferation. Atomic bombs were replaced in many arsenals with thermonuclear weapons in the 1950s and eventually were deployed on a lethal triad of bombers, ICBMs, and SSBN submarines. The United States during the Cold War manufactured 70,000 nuclear weapons that stole $5 trillion that might have been used for vital domestic programs (Connelly et al., 2012). It's been estimated that the destructive yield of the world's nuclear arsenals approached an equivalence of 1.5 million Hiroshima bombs (Stone & Kuznick, 2012). Nine nations now possess either atomic or hydrogen-nuclear weapons. Eight are declared nuclear weapons states: the United States, Russia, China, United Kingdom, France, India, Pakistan and the Democratic People's Republic of Korea. Only Israel has refused to acknowledge officially its nuclear weapons' status. There are still thousands of strategic nuclear weapons in the world's arsenals on hair-trigger alert status, despite some reductions in the START I (1991), START II (1993) and New Start (2010) treaties. The latter will "limit" Russia and America to 1550 deployed strategic warheads and 700 launchers within seven years (Baker, 2010).

Neo-Realism and Nuclear Weapons

Kenneth N. Waltz's neo-realism describes the international-state system as adrift in anarchy and "interdependence among them is low" (Waltz, 2010). Imposing on the state system a strongly suggestive Marxian materialist conception of history, Waltz argues the structure of the world order governs external state behavior regardless of national preference. Marx's dialectical materialism also minimizes human consciousness and volition in determining inevitable progressive cataclysmic change. Forces of revolutionary and societal tumult unfold independently from human will as substructural productive forces and productive relations undergo seismic inevitable transformation (Feuer, 1959). Robert Keohane also identifies elements of Marxian theory in realism's deterministic analysis of hegemonic domination and state behavior (Keohane, 1989).

Waltz believes nation-states, independently of their will, create balances of power to prevent hegemonic subjugation. The United States according to Waltz rearmed after World War II despite "a strong wish not to" (Waltz, 2010). He argues that Hiroshima and the development of nuclear weapons did not create a "new world" since "the perennial forces of politics are more important than the new military technology" (Waltz, 2010).

The global order, however, is structurally dynamic and America "has played a leading role in transforming the international system over the past sixty-five years" (Department of Defense, 2012). The nuclear era was revolutionary and created a new world out of "a world destroyed" (Sherwin, 1975). Our capacity to attain global annihilation reached a new level of terror and magnitude. Whether or not a structural realist determinism conditions interstate behavior, human-made institutions consist of sentient beings. They can adopt new strategies of self-preservation to cope with the present danger of a nuclear Armageddon. This is the challenge that lies ahead. Hiroshima led to nuclear proliferation as states attempted to either balance their power or pursue a mindless strategy of nuclear dominance. Yet the old tactics of power and the pursuit of the national self-interest in a world of thermonuclear warheads are hopelessly inadequate and must challenge the determinism of realism and neorealism.

Waltz, a structural theorist desires the spread of nuclear weapons. He welcomes the expansion of the nuclear club in the post-Hiroshima world as a stabilizing deterrent that mitigates anarchy and reduces armed conflict. Waltz described the fission bombs that destroyed Hiroshima and Nagasaki as "Model-T bombs" and noted inaccurately they were small because they could fit into a B-29 (Sagan & Waltz, 2003). "Fat Man", the larger of the two fission bombs, was eleven feet in length, weighed 4.5 tons, and had a yield of about twenty-one kilotons (Kirstein, 2003). They could barely fit into the bomb bay of the *Enola Gay* and *Bockscar* B-29 strategic bombers (Rhodes, 1986). They were large and B-29s had to be modified to fit them into the bomb bay. The modifications included the removal of all four bomb bay doors and the outer fuselage section between the two bomb bays (*Washington Times*, 2011).

Waltz believed, however, the nuclear climax of World War II demonstrated that nuclear weapons were small, hard to preempt, and useful in restraining additional war. He argued nuclear-weapon states through deterrence will always refrain from initiating a first-strike nuclear attack due to the uncertainty they could avoid a second-strike retaliatory nuclear response (Waltz, 2003). Nations will keep their nuclear-powder dry for fear they cannot escape retaliation. In Waltz's world nuclear proliferation contributes to strategic stability as "the gradual spread of nuclear weapons is better than either no spread or rapid spread" (Waltz, 2003). Horizontal proliferation according to Waltz' neo-realism preserves the peace as more nations grow increasingly wary of initiating a nuclear exchange (Waltz, 2003). Mu-

tual Assured Destruction (MAD) preserves the peace and averts nuclear destruction.

Strategic Bombing

In the pre-Hiroshima era, nations were eager to introduce more deadly and destructive weaponry onto the battlefield. World War II's nuclear ending reflected this conventional mindset when the United States used its fission bombs as the latest version of strategic bombing. Waltz claims poison gas and chemical weapons were not introduced in the war due to an informal deterrence in the absence of a monopoly of these systems. When both sides to a conflict possess weapons of mass destruction, conflict is avoided and peace through mutual assured destruction is maintained (Waltz, 2003). Even a few nuclear weapons can go a long way in preserving a state of non-war according to Waltz. Whether a nuclear-tipped world can permanently avert the use of these weapons places undue faith in theory and a belief that the structural dynamics of the interstate system are indefinitely predictable.

George Kennan, the architect of containment, represented a softer side of realism in asserting that World War II in particular and the use of violence in general retards the advancement of civilization and inhibits the spread of democratic values:

> But, basically, the democratic purpose does not prosper when a man dies or a building collapses or an enemy force retreats… And this is why the destructive process of war must always be accompanied by, or made subsidiary to, a different sort of undertaking aimed at widening the horizons and changing the motives of men and should never be thought of in itself as a proper vehicle for hopes and enthusiasms and dreams of world improvement (Kennan, 1951).

The unrestrained, intimidating rhetoric of the Potsdam Declaration is palpable: "We call upon… Japan to proclaim… the unconditional surrender of its armed forces, and to provide proper and adequate assurances of their good faith in such action. The alternative for Japan is prompt and utter destruction." Thucydides described a similar statement from the Athenians prior to attacking the island of Melos. In their colloquy with the Melians, the Athenians reject their plea for justice and conflict resolution: "Then you do not adopt the view that expediency goes with security, while justice and honor cannot be followed without danger" (Thucydides, 1951). The Melians are told they have a choice between "war and security," the latter meaning survival by surrendering to Athens (Thucydides, 1951).

Potsdam Declaration and Truman Threat

As Truman returned across the Atlantic from Potsdam on the USS *Augusta*, the White House released a written statement announcing the bombing of Hiroshima and the existence of the nuclear age (Truman, 1955). As seen with Athens and the Potsdam Declaration, the strong order the weak to surrender or die:

> We are now prepared to obliterate more rapidly and completely every productive enterprise the Japanese have above ground in any city. We shall destroy their docks, their factories, and their communications… If they do not now accept our terms they may expect a rain of ruin from the air, the like of which has never been seen on this earth (Harrison-Bundy Files, 1945).

Newly elected British Labour Prime Minister Clement Attlee also announced the Hiroshima bombing and released a statement Churchill had prepared prior to his General Election defeat and abrupt departure from Potsdam (Harrison-Bundy Files, 1945). It also threatened continued nuclear annihilation of Japan: "It is now for Japan to realize in the glare of the first atomic bomb which has smitten her what the consequence will be of an indefinite continuance" of the conflict (*New York Times*, 1945). Indeed three days after Hiroshima "Fat Man" produced 75,000 casualties in Nagasaki.

The Potsdam Declaration in thirteen paragraphs of threats and frenzied rhetoric proclaimed that "stern justice shall be meted out to all war criminals, including those who have visited cruelties upon our prisoners" (National Diet Library, 2011). Yet on August 6 and August 9, American prisoners of war were knowingly sacrificed in the atomic attacks. American POW were known to be held in Kokura but it made no difference where their camps were in Japan because the Target Committee did not want Japan to have a prisoners' veto over US target selection (Farrell, 1945).

American POW were also nuclear casualties in Nagasaki. General Farrell tersely described the killing of American prisoners of war in Nagasaki: "There was a prisoner of war camp in Nagasaki and that some few prisoners were made casualties by our bombing" (Farrell, 1945). LeMay admitted after the war, "I suppose if I had lost the war, I would have been tried as a war criminal" (Rhodes, 1995).

Alperovitz was determined to reexamine the past and develop a new history of understanding acts of violence with such great import. The realist perspective in no small measure contributes to the revisionist assault on the standard history of the bomb. It supports the use of force to advance the national interest and some realists supported the atomic attacks. Yet realism as seen above frequently requires reasonable moral restraint and yes, overarching ethical standards before resorting to the use of force that invariably destroys so many lives.

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Megalithism and Tribal Ritualism: A Passage through the Kurumbas of Attappadi

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The study of mortuary practices of Megalithic communities and its use as the basis for reconstructing the past society is unique in archaeology as it represents the direct and purposeful culmination of conscious behavior of the followers of this cultural trait. There are voluminous studies on the Megalithic builders of South India, including Kerala, written by prominent archaeologists and anthropologists from the early decades of the nineteenth century. Most of them ignored the continuity of Megalithic tradition, except a scant reference to the erection of funeral edifices among tribes like the Kurumbas and Mudugas of Attappadi and Mala-arayans of the Thiruvananthapuram district of Kerala. A study of the living Megalithic practices provides clues to ethnographic parallels, existing belief systems and habitation sites of the present communities. The present study discusses the cultural aspects of the rituals related to living Megalithic tradition among the Attappadi tribes, of the Palakkad district of Kerala. The study of the mortuary practices of the Kurumbas raises two important questions-firstly, how far this tribe can be seen as the actual successor of Megalithic builders of Kerala and, secondly, how does the social differentiation within the Kurumba community got reflected in its mortuary practices, just like the Megalithic builders of the past.

Keywords: Megalith; Kurumbas; Secondary Burial; Cheeru; Living Tradition

Introduction

The present study deals with the existence of Megalithic[1] traits as a living tradition among the Kurumba tribe of Attappadi. The study of mortuary practices of Megalithic community and its use as a basis for reconstructing the past society is unique in archaeology because it represents the direct and purposeful culmination of conscious behavior of the followers of this cultural trait. There are several studies on the Megalithic traits of tribal communities in India (Hutton, 1992: pp. 242-249; Mawlong, 1990: pp. 9-14; Grigson, 1932; Bondo, 1950) but barring a few, most of the studies on the tribes of Kerala ignored the continuity of Megalithic tradition among tribes like the Kurumbas and Mudugas of Attappadi and Mala-Arayans of the Thiruvananthapuram district. A study of such living Megalithic practices provides clues to ethnographic parallels, existing belief systems and habitation sites of the present communities. The present study discusses the cultural aspects of the rituals related to living Megalithic tradition in Attappadi, the Palghat district of Kerala. A study of the mortuary practices of the Kurumbas raises two important questions-firstly, how far this tribe can be seen as the actual successor of Megalithic builders of Kerala and, secondly, how does the social differentiation within the Kurumba community got reflected in its mortuary practices, just like among the Megalithic builders?

Kerala, situated on the South-Western Coast of India, preserves the heritage of a rich Megalithic culture in the form of a wide variety of burial monuments and of a survival of megalithic cult among the various tribal communities who inhabit on the slopes of the western ghats, which still provides a pristine habitat for more than 36 varieties of tribal communities. Among these, Kurumbas have a close affinity with Megalithic communities because they erected funeral memorials only after the performance of an elaborate secondary burial. The Kurumbas, the most archaic among the 3 tribes of Attappadi (the other two being Irulas and Mudugas), lives in the dense forest adjoining the Silent Valley of Palghat district of Kerala, which is a part of the Nilgiri biosphere. There are two divisions among the Kurumbas-Palu-Kurumbas and Alu-Kurumbas. Alu-Kurumbas are concentrated in South-Western, Southern, South-Eastern and Eastern slopes of the Western ghats, and in the upper elevations of the Nilgiris. The Kurumbas of Attappadi are Palu-Kurumbas and they are concentrated in the lower elevations of the ghats. Both these groups are shifting cultivators and they used to live in separate hamlets. Each hamlet is a closely knit kin group with nuclear families. These tribal communities have an unfailing faith in animism and ancestor-spirits (Tylor, 1871: p. 424) which determined the nature of their mortuary practices, though slight changes existed between the two due a difference in the physical environment. There are 14 Palu-Kurumba hamlets scattered in different parts of south-western Attappadi. Among these Thodikki hamlet is the most prominent and has a com-

[1]The word *Megalith* is derived from two words, *Mega* means big and *Lith* means stone. It is a custom of erecting huge funeral edifices over the relics of the dead. Along with the corpse all the belongings of the deceased are also deposited.

manding position regarding funeral ritual related to all the hamlets. From the archaeological point of view Todikki acquires a predominant position because it is from here that reports about the Kurumba tradition of erecting dolmen-like Megaliths came first.

Historiography

Historical writings on the living tradition of Megalithic practice in Kerala are very few. Most of the studies are concentrated on the typology of monuments, their individual and common features, comparison with those of other parts of India and the world, and the belief systems associated with Megalithism. The first notable effort in this direction was made by L. A. Krishna Iyer, who studied extensively the Megalithic culture of the whole region of Kerala. He noticed, for the first time, the similarity between the ancestor worship of the Megalithic people and the tribal practices. In his two important works, *The Prehistoric Archaeology of Kerala* (Iyer, 1948) and *Kerala Megaliths and their Builders* (Iyer, 1967) as well as in his article *The Disposal of the Dead among the Primitive Tribes of Travancore* (Iyer, 1939: pp. 61-62), he pointed out that certain Travancore tribes like the Mala-Arayans erected dolmens over their graves like the Megalithic people. In his famous work, *Travancore Tribes and Castes* in 3 Volumes, he studied the burial customs of various tribes of Travancore and found that burial was the common mode of disposal of the dead and they deposited grave goods along with the corpse.

In his *Early Man in Wynad* (John, 1975: pp. 125-131) and *The Megalithic Culture of Kerala*, (John, 1978: pp. 485-489) K. J. John studied the survival of Megalithic culture among the lower caste Hindus and tribal communities of Malabar. He pointed out that majority of the tribes who live on the Western Ghats practice a burial custom which is very close to Megalithism of the ancient days. He argued that the cult of Muthappan and *teyyam* ritual dance is a cultural relic of the tribal tradition of ancestor worship.

Dieter B. Kapp in his remarkable article, "The Kurumbas' Relationship to the 'Megalithic' Cult of Nilgiri Hills (South India)" (Kapp, 1985: pp. 493-534) examined the past and present relationship of the Nilgiri Kurumbas towards megalithism. The most significant features of this article is that it presented the erection of dolmens, stone circles and various other lithic remains as a pointer to the cult of megalithism as a living tradition among them even today.

Megalithic Traits in Kurumba Burial Practices

Disposal of the Dead

"The onset of death is universally the subject of ritual, and there is not a single human society that simply throws the body out as a mass of decaying protoplasm" (Murphy, 1989: p. 211). And, for the Kurumbas, rituals are very elaborate, complex and weird. Their mortuary practices had three phases-pre-burial, burial and post-burial or secondary burial. According to Alekshin, the most important component of burial practice is ritual-the activities sanctioned by tradition that occur before, during, and after the burial and are considered essential to the transfer to the other world of deceased members of the community, both those forming its nucleus and others related by blood (Alekshin, 1987: pp. 137-138). Most important pre-burial ceremonies are announcement of death, purification ceremonies, funeral dance etc. Interment and mourning are the most common ceremonies of the second phase. Through interment the corpse is put inside the pit dug in the ground and the grave is filled, after inhuming the body inside it, with earth. Their graveyard, which is located away from the settlement in the forest, is known as *Chodalai* and graves are dug by expert gravediggers from the tribe. The grave is 6-feet deep and has a side cavity called *Allekkuzhi*, where the body of the deceased is placed and well protected with bamboo mats.

Grave-Goods

The corpse will be interred with a variety of goods including the personal possessions of two varieties-one domestic possessions of the deceased person like different kinds of food materials and water, clothes, ornaments, pottery, money, a cane basket known as *tekku* which contains different varieties of grains and second varieties are implements like knife, hoe, axe, spade, sickle, digging stick etc. Grains such as rice, millet, ragi, kora, thuvara, etc. also are mainly interred. Money is the token for the ferry charge to cross the river in the land of the dead for the spirit. After interment Kurumbas used to fix a stone as a burial mark at the head. All these grave goods gives us important historical clues like the type of their economy, type of metals used by them, their dietary pattern, anthropological data, belief in life after death etc.

Social Differentiation

It has been suggested that the social position of the departed is one of the important elements of the burial practices. It consists of the collection of material elements—the burial structure, the assemblage of grave goods, and the position of the deceased-required for a person of a particular age and sex to be transported to the other world (Alekshin, 1987: pp. 137-138). This social differentiation is reflected in mortuary ceremonies and clearly in the deposition of grave goods. The burials of infants are devoid of grave goods. On the basis of productive activities grave goods of men and women vary. Being an agricultural and hunting community, the Kurumba men are engaged in hunting and fishing and in various agricultural activities like ploughing while the women are involved in reaping, making baskets for keeping grains and digging tubers. Hence the most prominent grave goods deposited in men's graves are hoe, fish hooks, arrows, axe etc. whereas those in the graves of women are sickle, digging stick, needle and cane basket. Besides, a Kurumba woman is buried along with her precious and semi-precious ornaments. Thus their burial deposits appear to be richer than those of men.

Secondary Funeral and Erection of Memorial

The secondary burial ceremony of the Kurumbas is popularly known as *Cheeru*, (Poyil, 2009: pp. 31-38) which is protracted and very elaborate. Through this ceremony Kurumbas make necessary arrangements for the spirit's journey to the land of the dead. The Kurumbas called their spirit *Nikal* or shadow. The ceremonies connected with *cheeru* are spread over four days. This post-burial ceremony is conducted after the death of 101 members in a settlement; hence it took 10 to 20 years or more between two *cheerus*. This long interval between two

cheerus is also caused by the huge expenditure incurred in celebrating this event. The prime ceremony is the collection of specific bones, i.e., clavicle, of the dead from the graveyard. The clavicle of the person who had died first after the last *cheeru* is collected first. A decorated funeral car known as *gudikettu* is constructed with a sacred chamber called *gubbe* at the bottom. The collected bones are kept inside the *gubbe* till the end of *cheeru*. The funeral rites are accompanied by funeral song, dance and music, feast and blood sacrifice.

At the end of the *cheeru* bones are taken to a sacred place known as *nikalumalai* or shadow-land, situated in the forest away from each Kurumba settlement, where the remains of the forefathers are kept. Then the bones are put inside a dolmen-like structure known among Kurumbas as *malikai* or *matinati*. A fitting farewell to the spirits is indispensable because the soul or *nikal* remains alive after death and it hovers around the hamlet to cause harm to the members of the entire hamlet. Hence it is essential to provide a permanent abode for the spirits.

Conclusion

Burial practices are significant archaeological sources for the analysis of past and present human societies. Thus knowledge of the living Megalithic tradition is helpful in unfolding the past history of early Iron Age communities. It would also enable us to trace out the antiquity of those communities who follow megalithism presently. In order to extract this information, tribal burials have to be excavated carefully and all the grave-goods accurately recorded so that a comparative investigation with tribal funerary ceremonies would be possible.

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Temple as the Site of Struggle: Social Reform, Religious Symbols and the Politics of Nationalism in Kerala

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The temple entry movement of the 1920s and '30s in Kerala, South India, has become a landmark in the history of social reform and nationalist movements for its uniqueness and sweeping success. Popular history has presented the episode as an integral part of the Nationalist Movement and the Gandhian Constructive Programme mainly because the temple-entry issue was endorsed by the Kerala State Congress Committee and the agitation was concluded under its auspices. But this popular and idealist impression of the movement has been challenged from various quarters. It is pointed out that there have been very little attempts at linking the event with the advancing civic rights movement led by the lower caste people for freedom of worship and social equality which was gaining a radical turn by the 20s and 30s; the pressure exerted by the untouchables to achieve civic freedom even at the cost of renouncing Hinduism had created an alarming situation which no caste-Hindu could ignore. Even more surprising is the absence of academic attempts to link the agitation with the Malabar Rebellion of 1921; in fact the Rebellion had challenged the very survival of the Congress organization in Kerala; this factor forced them to retreat from the earlier secular plane to a religious idiom of politics for which the question of temple-entry served their purpose. The Temple entry movement, therefore, has to be studied in the light of the antipathy shown by the Congress towards popular and radical agitations and in the context of its growing tendency to incline towards Hindu symbols in politics as a means to escape addressing vital and burning social issues.

Keywords: Temple-Entry; Constructive Program; Vaikam Satyagraha; 1921 Rebellion; Religious Conversion; Indian National Congress

Introduction

Social reform movements of early twentieth century Kerala differed from their north Indian counterparts in certain basic features. Firstly, they overlooked individualistic and usually female-oriented reform programs and confronted inequalities among Hindu castes, which were more glaring in Kerala than anywhere else in India. At the early stages of the all-India reform movements the "evils" of society, mostly inflicted upon women-sati, the prohibition on remarriage of young widows, purdah, the custom of early marriage, and lack of educational opportunities for them-engaged the reformers' attention, and crusades for laws to protect (mostly high-caste) women and the founding of institutions to support and educate them defined the practical reform programs (Heimsath, 1978: pp. 24-26). In Kerala, women's causes never caught on[1]; Kerala's social evil was caste. Secondly, they were all caste/community movements; preoccupation with community-subjects marked their social presence. The process of the "construction of Hinduism" (Muraleedharan, 1996; Viswanathan, 2003), which was one of the focal points of the early social reform movements of North India, both as a desperate resistance against colonialism ("Resistant Hinduism" against "Renascent Hinduism", Young, 1981) and as a prospective nationalist program, was only a succeeding agenda for the reformers of Kerala[2]. In other words, what was at stake was primarily the status relationship between communities; the formation of a unified Hindu religious community, by forging a symbolic unity of castes through the portal of the temple[3], was not taken up seriously till the early 1920s. Thirdly,

[1]Mainly for the reason that society had been impregnated with mother-right cultural norms and thus women—except in Nambutiri Brahmin and some Muslim households—were already liberated. Customs like Sati, female infanticide, and the disfigurement of widows which so enraged Indian social reformers, failed to emerge from the mother-right culture of Kerala. Widow remarriage, a highly charged issue throughout India, caused no ripples either, because most low caste and Nair widows freely remarried. Among the Nambutiris mature marriage was the norm, not child marriage, and so widowhood could not claim major attention among their reformers. Infant marriages among all communities were rare.

[2]The Renaissance intellectuals focused mainly on relieving Indian religion of the features most attacked by Christian missionaries and to remodel Hindu religion in accordance with the Judeo-Christian conceptions of monotheism and anti-idolatry. This process of shaping Hindu religion according to a totally alien concept is termed as "Construction of Hinduism".

[3]"Hinduism… does not meet the fundamental requirements of a historical religion of being a coherent system; but its distinct religious entities do. They are indeed religions; while Hinduism is not" (Stietencron, 1989: p. 20) The lower caste Hindus had their own shrines (*kavu*), the belief system and ritual practices of which were basically different from that of the Brahmanical temples. The Izhava social reform movement was a campaign to "sanskritize" their social customs, rituals and ceremonies: Aryan gods to replace primitive deities ("to obtain high gods for lower castes", Lemercinier, 1984: p. 248), learning of Sanskrit and founding of school for Vedanta and the congregation of monks.

these movements played a very insignificant part in the anti-British nationalist opposition (Houtart & Lemercinier, 1978: p. 5). The outstanding enemies here were internal, and the British colonist appeared to the depressed communities as an element favorable to their emancipation, since it was he who had been responsible for the abolition of slavery and for so many liberal reforms. For the upper castes too the British offered opportunities for emancipation, since educational progress and changes in marriage rules were largely dependent on their consent. In general, thus, the attitude of the caste associations towards the emerging nationalist movement was one of distrust and caution.

Against this background, my attempt here is to discuss how the temple-entry movement of the 1920s and '30s signified the above mentioned features and determined the nature and general course of nationalist politics in Kerala. It rejects the nationalist proposition of the temple-entry movement as a great humanitarian and philanthropic endeavor mediated by the Gandhian programme of social upliftment (Pilla, 1986: pp. 357-368; 409-415; Chandra, 1989: pp. 224-234; Menon, 2001: pp. 141-163; 316-331; Menon, 1997: pp. 74, 82) towards creating a "community of equals" and places it against deep social pressures from below. In fact the episode of temple entry agitation represented a conclusive act of the movement for civil rights led by the untouchable castes from the early nineteenth century (Jeffrey, 1978a: pp. 136-169). But the Congress involvement in the struggle in the 1920s, and even later, should be examined from two political standpoints—a shrewd drive to pacify lower caste radicalism (Aloysius, 2010: p. 181) (which was aggravated by religious conversions) and to find a quick deliverance from the moral setback inflicted by the Rebellion of 1921 (which in fact threatened to destroy the very foundations of the Congress in Kerala). The highly complicated socio-political environment brought about by the rebellion problematized both the future course of nationalist political action and the status quo of existing community and class relationships upon which nationalist politics had laid its roots.

This paper, apart from examining the role of lower caste radicalism in engendering the temple-entry movement, examines the hitherto unexplored story of the impact of the 1921 Rebellion in putting pressure on the Congress to deviate from its earlier secular stance to an apparent Hindu idiom of politics. Historians have noted this point earlier (Jeffrey, 1978a; Menon, 1994) but a serious effort to develop it into a polemic has not been undertaken. My attempt here is to create a counter-narrative, not by depending on any new sets of empirical data, but through a re-reading of the existing texts, which are, however, mostly of elite origin. Sources having subaltern inclination are rare, but those that are available from the part of both the Izhavas and the Mappilas are certainly made use of; the missionary and colonial records are treated with care as they represent another set of elite sources. The paper would first trace out the social situation of nineteenth century Kerala, the long history of the movement for civil liberties and the politics of rising nationalism, and then proceed on to discuss how the temple entry agitation reflected the concerns of the caste Hindus about the growing lower caste radicalism and attempted at addressing it through social reform measures.

Historiography

Though there are plenty of literature on the civil liberties movement, the nationalist struggle and the 1921 Rebellion, and a few attempts at connecting the temple entry movement with the conversion issue, there are practically no attempts at linking it with the 1921 rebellion. The Census Reports of Travancore and Cochin from 1871 to 1941 as well as the manuals of Travancore (Aiya, 1906; Pilla, 1940) and Cochin (Menon, 1911) contain rich data on the condition of the untouchable castes. The two manuals of Malabar (Logan, 1887; Innes, 1908) discussed the role of the colonial state as instrumental in emancipating the downtrodden. Some of the anthropological studies taken up during this period (Thurston, 1909; Iyer, 1909, 1939) discussed the social condition and inter-caste relationships to analyze how customs and traditions stood to counter the engagement with modernity. We have three important pieces of missionary literature (Day, 1863; Mateer, 1871, 1883) which looked down at the "primitive" and "superstitious" customs and systems of the people of the land and placed Christianity as a great redeeming force. Two recent studies also have tried to locate missionary intervention and the presence of a powerful Christian community as decisive factors in the modernization of Kerala society (Kawashima, 1988; Onwerkerk, 1994).

Academic studies on the social and religious reform movements of Kerala in general and the Izhava reform movement in particular placed them against the existing "context" (of caste, social evils, deprivation) and the impending forces of modernity (new education, missionary activity, colonial agency and the rising middle class consciousness) and analyzed the varied factors which helped or obstructed the potential of different social groups to appropriate reformism as a means to overcome their state of deprivation. (Rao, 1979; Isaac & Tharakan, 1988; Jeffrey, 1994). There were also attempts at examining the factors for the radicalization of the Izhava caste movement and its later inclination towards left-wing ideology (Jeffrey, 1978b). Some scholars considered missionary presence as instrumental in the gradual radicalization of the Izhava movement and the slow expansion of its emancipation agenda (Pulapilly, 1976). There were also attempts at analyzing the ideological foundations of the reform movements and to identify the unique features of the "Kerala Renaissance" (Houtart & Lemercinier, 1978; Heimsath, 1978, 1982).

On the Malabar Rebellion we have an unending series of literature belonging to diverse ideological streams ranging from colonial to nationalist and Marxist to subaltern. Discussion on the Rebellion has generally been focused on whether they were communal or agrarian uprisings, or whether they were motivated by economic or religious imperatives. Despite "fanatical outbreak" being the predominantly shared official version of the uprisings, agrarian grievances as a possible factor did not remain totally unnoticed. Two early exponents of the religious interpretation (Conolly, Strange), while recognizing the poverty and destitution of the Mappila "fanatics", rejected them as a reason for the "outbreaks". In contrast, Logan identified agrarian discontent as the main causative factor, but underlined the turbulence and fanatical character of the Mappilas (Logan, 1887). The government held that Mappila religiosity exacerbated by nationalist politics was the prime moving force behind the rebellion of 1921 (Tottenham, 1922; Nair, 1923; Hitchcock, 1925). More recent studies have attempted to interpret the militancy of the Mappilas as a means of defending the frontier of Mappila society-internal frontier was with the Hindu society dominated by landholding Brahmins and the external frontier with the Europeans, from Portuguese to the British. The nineteenth century uprisings were jihads to defend the internal Islamic frontier.

The rebellion of 1921 was different in that it was directed towards an identifiable political goal, i.e., establishment of an Islamic kingdom (Dale, 1980). The nationalist version is represented mainly by the autobiographical sketches of the Congress leaders which, while justifying the decision of the Congress to uphold the Khilafat issue, found fault with the government policy of repression and the irrationality and intense religiosity of the Mappilas (Nambutiripad, 1965; Nair, 1971; Menon, 1986). A dominant section of left wing historians followed an essentially economic interpretation, treating agrarian discontent as the prime factor with religion as a means of mobilization (Nambutiripad, 1952; Hardgrave, 1977; Dhanagare, 1977; Wood, 1987; Gangadharan, 1989; Panikkar, 1989). Among them Panikkar's study stood different in that it treated the context (anti-British feeling and the urge to free from the exploitation of the propertied classes) and ideology (religion translated discontent into action and provided the vision of an alternate society) equally decisive. A recent study examined the uprisings from a subaltern perspective and placed the Mappila insurgency along subalternity and religiosity, which are specific to premodern consciousness, in order to exonerate it from the alleged blemish of "communalism" and "jihadism" (Ansari, 2005).

For a survey of the nationalist movement in Kerala we have several studies, both panegyric and critical. Studies which followed the official Congress view (Pilla, 1986; Menon, 1997; Menon, 2001) perceived the shifting strands of nationalist position with reference to its primary (anti-colonial) preferences and its (umbrella-type) all-class and secular character. The disposition of the Congress in taking up the internal issues affecting class/caste relations on a secondary footing has been justified on this premise but it is further argued that the constructive program was actually devised to serve this purpose—to supplement political action through social and humanitarian work (including efforts to eradicate untouchability)—which aimed at cleansing the nation of blots which stood against true and ideal nationhood. The nationalist reading of the temple-entry movement followed such a glossy picture: uplift of the depressed sections of Hindu community through constructive program was an integral part of the work of the Indian National Congress in Kerala (Menon, 2001: pp. 141-163; 316-331). That the dual task taken up by the Congress, to build the nation and to construct a solid Hindu community, was not a mistaken strategy; in the context of the predominantly Hindu majority nation-state, the appropriation of Hindu religious symbolism was not incongruous (Chandra, 1989: pp. 230-234). A critical stream against the nationalist position came from various quarters, especially the left and the subaltern-dalit groups. The left perceived the nationalist movement as having had an implicit class agenda which got reflected in its ideology and method of political action and argued that the constructive programme was devised to establish Congress hegemony over low castes and untouchables and to pacify the mounting "pressures from below" which threatened to offset the interests of the dominant social groups who were steering the movement (Nambutiripad, 1952: pp. 131-132; Sarkar, 1990: p. 230). An article on Guruvayur satyagraha, while treating it as a part of the nationalist movement, analyzed the role of factionalism within the Congress as a possible reason for diverting the Civil Disobedience Movement (CDM) into a social struggle and attributed the failure of the struggle to the basic limitations of the Congress attitude towards untouchability (Gopalankutty, 1981). The Dalit perspective blamed Gandhi for perceiving untouchability simply as a religious issue, not as a question of civil right, and hence in practice, it appeared to counter their own idea and struggles for emancipation (Aloysius, 2010: p. 181; Ravindran, 1988).

Two studies have tried to link the temple-entry agitation with the struggle for civil rights and the inner politics of the nationalist movement (Jeffrey, 1978a; Menon, 1994). While the former identified the "modernizing" impact of colonialism and the "civilizing" impact of missionary work as decisive in the creation of a powerful middle class and a congenial ideological environment leading to radicalization of the reform process, the latter discussed the difference in the degree of power and deprivation among hierarchically arranged social groups in the traditional social order and presented the nature of their response to colonialism/nationalism on the basis of the degree to which the changes which took place under the colonial system favored their emancipation/retention of privileged position.

The Social Spectrum of Kerala

The caste structure of colonial Kerala stood different from the pan-Indian scenario. The existing varna and jati system varied from the ideal four-fold model with the total absence of the Vaishyas and a very marginal Kshatriya presence; the traditional trading and commercial functions were by and large the preserve of the non-Hindu communities like the Jews, Muslims and Syrian Christians and the ruling lineages of medieval Kerala were substantially drawn from Sudra-Nair caste who however were gradually elevated to Kshatriya-Samanta status. Brahmins (including the Kerala Brahmins called Nambutiris and the immigrant Tamil and Kannada groups) constituted a mere 1% of the population of the land but they occupied the upper echelons of ritual hierarchy and owned substantial landed properties. The populous, martial and matrilineal caste of the Nairs, who were the ruling class and constituted a substantial portion of the military force in the pre-British era, were accorded higher status for being "clean sudras" which led the Brahmins to enter into alliance with them by arranging liaisons with their women[4] and by entrusting them with the management of their landed estates and temples. All of the above groups along with the several tiny castes of temple-servants called Ambalavasis constituted the elite Hindus (*savarna*). All the castes below the Nairs were *avarnas* (untouchables) and included, in terms of hierarchy, the Izhavas, Pulayas, Cherumas, Parayas and Nayadis. In addition there were the fishing and tribal communities. Pulayas, Parayas and Cherumas served as agrestic laborers and occupied very low social position and economic power tantamount to serfs. Defilement practices consisting of untouchability, unapproachability and even un-seeability determined inter-caste relations and was apparently influenced by the notion of hierarchy. The *savarna-avarna* divide mediated by socioeconomic and political inequalities hardened and dehumanized relationships between social groups.

An examination of the position of the Izhavas in the traditional social structure reveals the range and magnitude of diverse kinds of relative deprivation. They are an ethnic category, found all over South India (Izhavas and Shannars in South Tra-

[4]Such conjugal alliances were called *sambandham* in which the male partners were just "visiting husbands" and the wives along with their children lived in matrilineal extended households maintained by impartible joint property. This practice was popular among matrilineal castes like the Nairs, Kshatriyas and Ambalavasis who had liaisons with the Brahmins.

vancore, Chovans in North and Central Travancore and Cochin, Tiya in Malabar, Billava in Tulunad, Nadar in Tamil Nadu and Idiga in Mysore) and the various cognate castes in Kerala constitute a large ethnic bloc. The most popular theory is that the Izhavas were migrants from Ceylon (Aiya, 1906: pp. 398-402; Thurston, 1909: pp. 292-418; Innes, 1908: pp. 124-125; Logan, 1887: p. 80) and were Buddhists by faith (Kunhuraman, 1925; Aiyappan, 1965: p. 119). The occupation of the Izhavas in the traditional caste order was coconut plucking and toddy-tapping, though they were engaged as tenant cultivators, agricultural laborers, weavers and coir workers. They also practiced ayurveda and astrology and had a tradition of military service (Iyer, 1909: p. 298). The Izhavas ranked lower than the Nairs and above the Cherumas/Pulayas in the caste hierarchy. Though the Izhavas were at the top of the category of castes who caused distance pollution, they had to keep a distance of 36 feet from the Nambutiri Brahmins and were not allowed to enter temples managed by the upper castes. They also did not have the right to use public roads and wells of the upper castes (Aiyappan, 1944: p. 39) and were denied admission in caste Hindu schools and government jobs. Their women were not allowed to wear upper garments or any ornaments. The Nairs often demanded unpaid labour (uzhiyam) from them (Mateer, 1871: p. 43; Day, 1863: p. 322). Under the existing three-tier agrarian social structure, most Izhavas occupied the position of sub-tenants or agricultural laborers. Most of the *janmis* were Nambutiris, Kshatriyas or aristocratic Nairs. *Kanam* tenants who held the lease for a period of twelve years (but sub-leased them) were mainly Nairs. *Verumpattam* was the lease for a three year tenure and Izhavas and Mappilas were the prominent sub-tenants. Agricultural laborers formed an important category, and this consisted of the Izhavas, Pulayas and Cherumas.

The political attitude of the Mappila community of Malabar represented a more complex pattern. Mappilas (or Moplahs), the Muslims of Malabar, traditionally trace their origins to the ninth century, when Arab traders brought Islam to the west coast of India (Miller, 1992: pp. 40-45). By 1921, they constituted the largest—and the fastest growing—community of Malabar. With a population of one million, 32 percent of that of Malabar as a whole, the Mappilas were concentrated in south Malabar, i.e., in the Ernad, Valluvanad and Ponnani taluks of the erstwhile British Malabar described in colonial records as "fanatical zone" (Innes, 1908: p. 89). In Ernad taluk, the center of the rebellion, they formed nearly 60 percent of the population and in Walluvanad, 35 percent. The community has been characterized as consisting of pure Arab settlers, of the descendants of the Arab traders and women of the country, and of converts to Islam from the lower Hindu castes (Innes, 1908: p. 26). The Mappilas were a mercantile community concentrated along the coast in urban centers. Segregated from the Hindu population in separate settlements, they had considerable autonomy, and under the Zamorin of Calicut, they enjoyed prestige as well as economic power (Zaynu'd-Din, 1942). From the sixteenth century, with the rise of Portuguese power in challenge to Mappila commercial interests, the greater portion of the community moved into the interior of Malabar and increasingly came to be agricultural tenants, low in status and desperately poor (Dale, 1980: pp. 54-82). In sharp contrast to the general prosperity enjoyed by the Mappilas of the North (where early converts included propertied classes of the high castes), the Mappilas of South Malabar were principally converted from the lower Tiyya, Cheruman and Mukkuva castes, for whom "the honor of Islam" brought freedom from the disabilities of ritual pollution. It was in these inland areas of the south and among the poorest sections of the population that the Mappila community expanded most rapidly (Hitchcock, 1925: p. 9).

During the successive invasion of Hyder Ali and Tipu Sultan, in the late eighteenth century, Malabar was thrown into social turmoil. The Mappilas tried to reap political and economic gains from it by declaring their proprietorship rights over their tenurial lands and by remitting land tax directly to the government defying caste-Hindu landowners (Dale, 1976; Miller, 1992: p. 81; Menon, 1999). The caste Hindus responded to this hopeless situation by fleeing from Malabar and seeking refuge in the self-proclaimed Hindu state of Travancore after either disposing of their property or deserting them to the Mappilas (Narayanan & Kesavan, 1983: p. 275). The situation was also significant in that large number of lower caste Hindus utilized the opportunity to enhance their social prestige by embracing the religion of the new rulers (Kunju, 1989: p. 79). The defeat of Tipu and the subsequent British land settlement policies in Malabar, leading to the restoration of the social and economic position of the dominant castes, severely affected the position of the Mappilas in South Malabar—by imposing enormous amount of rent and by fixing heavy renewal fees on tenurial contracts (*melcharth*) (Panikkar, 1989: pp. 1-48), they were oppressed in particular. Reduced to insecure tenancy, vulnerable to rack renting and eviction at the hands of Hindu *janmis* sustained by British courts, the Mappilas responded in a series of outbreaks[5]. During the course of these nineteenth century outbreaks, the number of conversions to Islam heightened dramatically. In converting to Islam, those of lower castes were not only freed from the traditional social disabilities of the outcaste, but they joined a community of resistance wherein their protest against *janmi* tyranny was supported by their fellow Muslims (Hardgrave, 1977: p. 62)[6]. The recurrent Mappila riots of the 19th century were, to a large extent, in spite of their predominant religious character (Dale, 1975), defensive responses to, or retaliatory acts against, such tyrannical acts and in that sense were essentially economic phenomena (Gough, 1968-1969). The sweeping militancy of the Mappilas and the exceptional enthusiasm they expressed in violating traditional caste dharma combined with the rise in their demographic strength intensified the

[5]The term "outrage" was used by the British to refer to those outbreaks of Mappilla violence in which the attack usually against a nambutiri or Nair landlord; sometimes against a European official or a convert who had slipped back into the Hindu fold and thus threatened community solidarity was followed climactically by the religious suicide of all involved, in the secure knowledge that by their martyrdom they would attain the *houri* bliss of Paradise. The incidents in which the mappillas "sought actively their own death", 29 in number between 1836 and 1919, were normally suppressed in a few days and involved in each case a relatively small number of people. Only in eight of the outbreaks did more than ten Mappillas become martyrs (or shahids) (Hardgrave, 1977: p. 62).

[6]The Census of India, Madras (1871: p. 7) noted that the Cherumas "have to a large extent embraced Mohammedanism, and in so doing have raised themselves and their successors in the social scale. The tyranny of caste no longer affects the Mussalman converts and under these circumstances it is no cause for surprise that the Mussalman population on the Western Coast should be fast increasing". Subsequent Census Reports recorded the continued Mappila increases and actual declines in the number of Cherumas reported. Between 1871 and 1881, the Mappila population of Malabar increased by 12.3 per cent, compared to only 3.4 per cent of non-Mappilas (Census of India, Madras, 1881: pp. 39-40). Between 1881 and 1891, Mappilas increased by 18 per cent, in comparison to a 10 per cent increase for Hindus (Census of India, Madras, 1891: p. 67).

social distance between the Mappilas and the high caste Hindus (Miller, 1992: p. 98). The setback inflicted on the material interests of the dominant groups had started to articulate slowly in the form of religious polarization and in widening the communal divide.

In 1852, a special commission, headed by T. L. Strange, was appointed to investigate the causes of the outbreaks. Strange rejected the view that the disturbances had their origin in agrarian discontent or poverty and attributed it to religious fanaticism stirred by the teachings of ambitious priests. He recommended a repressive policy, enacted into law in the Moplah outrages Act, XXIII and XXIV of 1854. A special force of police was raised in Ernad to enforce these measures (Logan, 1887: pp. 570-571). The failure to quell the outbreaks despite strong police measures persuaded the government to appoint William Logan, the District Collector, as Special Commissionaire, in 1881, to enquire into land tenures and tenant rights in Malabar. Logan believed the problem to be rooted fundamentally in the early British misunderstanding of the traditional relationship of the *janmi* to the land. Rather than seeing the *janmi* as one of several agricultural classes with rights to the land and its produce, British officials viewed him as rather like an English landlord to be protected with the force of Law (Logan, 1887: p. 584). However, the government refused to implement his recommendations which is evident from the statement of District Collector Innes who writing at the turn of the century attributed the outbreaks to "three main causes, poverty, agrarian discontent and fanaticism, of which the last is probably the chief" (Innes, 1908: p. 89).

The establishment of British rule marked the beginning of a social transformation. A notable feature was the consolidation of diverse political units into larger administrative ones. By 1793 the whole of Malabar came into the hands of the British and became a district of the Madras presidency. Travancore and Cochin continued under princely rule but as subordinate allies of the British and guided by a British officer called Resident in administration. The consolidation of power in the British hands led to the introduction of a uniformity in basic legislation. Slavery was abolished in Malabar in 1843 by the British and through Royal Proclamations in Travancore and Cochin in 1853 and 1854 respectively (Basu, 2008: pp. 57, 62-63). But in the realm of land tenure and educational progress law and custom stood opposite to each other. In 1793 the British recognized the *janmi* as the owner of the land and *kanakkar* as the lease, holding a mortgage. Thus the *verumpattakar* tenants were dependent on their lords and if they revolted against the landlord, they were evicted. From the beginning of the nineteenth century, large number of schools was started by the Christian missionaries to impart education to the converted people. Taking queue from them, the governments of Travancore, Cochin and Malabar opened schools, but it benefitted the Nairs and the Syrian Christians. As untouchables, the Izhavas could not profit from them but the mission schools provided them openings for education. The strong anti-British attitude of the Mappilas kept them away from English education for a long time. The Tiyyas of Malabar and the Muslims of Travancore fared well and did not face much deprivation; under direct British rule, the Tiyyas could prosper educationally and socially and as traders and landowners, the Muslims of the princely states could make use of the possibilities opened up by modernity (Logan, 1887: p. 144; Iyer, 1909: p. 283).

The Civil Rights Movement

Kerala began to experience the impact of colonial modernity from the early decades of the nineteenth century, the ramifications of which were felt in the public sphere in different times and in different degrees. One of the most important impact was felt in the social realm, in the form of efforts at reforming customs and democratizing social relationships. It was the (Protestant) Christian missionaries (such as the London Mission Society (L.M.S) in Southern Kerala, Church Mission Society (C.M.S) in Central Kerala and Basel Evangelical Mission Society (B.E.M.S) in Northern Kerala) who took the pioneering steps in promoting social reforms; they actively engaged in spreading the message of reform by imparting modern education to the untouchables and encouraging the new converts to openly question symbols of caste oppression and rules of ritual pollution (Aiya, 1906, I: p. 525; Manavalan, 1990: p. 120). The revolt of the Christian converted Shannar/Nadar women of Southern Travancore to get their right to wear upper garments really shook southern Travancore in the first half of the nineteenth century (Hardgrave, 1968)[7]. Similarly, the activities of the missionaries and the pressure exerted by them played a decisive role in coercing the governments to abolish slavery in both Travancore and Malabar in the middle of the nineteenth century (Basu, 2008: p. 74). The missionaries were also the first to introduce print-culture in Kerala. They utilized the print media to oppose customs and practices which had contradicted with modern outlook and human reason (Anderson, 1983: pp. 41-49)[8]. The efforts of the missionaries had had its desired effect, especially among the lower castes, and large mass of such people became converts to Christianity. But missionary appeal failed to much impress the upper or middle level caste groups; even the untouchable caste of the Izhavas took advantage of the new opportunity and the newly acquired knowledge to attain upward social mobility within the existing Hindu social order through radical social reform (Sahodaran, 1920: pp. 290-294; Jeffrey, 1974: p. 48)[9].

Early attempts at social reform were followed by organized struggle for social change which also had its genesis in the princely state of Travancore. Though being conservative and very vigilant in protecting the old social order, the government had started "modernizing" the state by founding schools, roads, law courts, and efficient bureaucracy. Meanwhile, a powerful middle class, which had been developing among the untouchable caste of the Izhavas, grew more and more frustrated over the state policy of keeping them away from government schools and service. In 1896 the Izhavas of Travancore submitted a huge memorandum (signed by 13176 men known as *Izhava Memorial*) calling upon the government to open public schools and services to them (Rao, 1979: p. 34). The failure of such

[7]The struggle is examined from various viewpoints. While some people from within the caste see it as part of an epic struggle to free the lower classes from feudal domination (Yesudas, 1975), the missionary perception take it as the triumph of decency and Christian values (Mateer, 1883: Ch.XXXIV). Hardgrave regards it as part of a wider movement within the caste order of south India for the Nadars to raise their status in the social hierarchy (Hardgrave, 1969).

[8]Anderson attributes the success of European Reformation to print-capitalism and stresses the coalition between Protestantism and print-capitalism.

[9]*Sahodaran*, the magazine published by the radical Tiyya lawyer C. Krishnan from Calicut, urged the Izhavas to concentrate on reforming Hinduism from within as no other religion was so liberal and tolerant. Jeffrey added that as large number of Izhavas prospered, they were able cautiously to imitate the manners of Nairs.

early steps persuaded them to turn towards more radical measures under a strong organization, that is, the S.N.D.P. Yogam under the powerful leadership of Sri Narayana Guru. The Yogam took up a two-pronged struggle—the fight for social equality and freedom of worship and the internal reform of the Izhava caste to make it a model community (Pulappilly, 1976: pp. 35-39). The radical demands raised by the S.N.D.P. in Travancore, such as the freedom to use public roads and temple-entry and representation in government jobs and legislatures, and the strategy of mass struggle they adopted to achieve their demands, clearly reflected their resolve to transform—not merely to reform—the existing social structure (Heimsath, 1982: p. 33). In British Malabar, the state did not adhere to caste rules and hence the lower castes could get recruited into even higher government posts (Menon, 1901: p. 182; Kesavan, 1968: pp. 263-270). Thus the Tiyyas in Malabar were not as deprived as their Izhava counterparts in Cochin or Travancore and hence militant lower caste social reform movements failed to take roots in Malabar.

By the 1920s the movement for civil liberties was taking new proportions. As already noted, the lower caste untouchables had expressed their resolve to better their social position through mass conversion (to Christianity in southern and central Kerala and to Islam in northern Kerala) and to distance themselves with the politics of nationalism since the Indian National Congress was identified to represent upper caste interests and to perceive the colonial master as a potential ally in the path to social emancipation. But the middle level caste of the Izhavas who till then refused to experiment the possibilities of the politics of religious conversion and worked to occupy a "respected place in Hindu society" than to satisfy with a "doubtful Christian role between contemptuous Syrians and polluting Pulaya converts" (Jeffrey, 1974: p. 48), now began to seriously think of renouncing Hinduism for getting a more honorable status in the civil society. The Congress decision to uphold the cause of temple-entry stemmed from this predicament, because religious conversion was slowly growing into a vital social issue capable of subverting the existing social equilibrium solidly rooted in birth rights and hereditary social privileges.

The Nationalist Politics

The nature of political awakening in Kerala differed in the three political regions in accordance with the prevailing political climate—while in Malabar where direct colonial rule existed, nationalist movement had made deep inroads by the beginning of the Gandhian era but in the princely states of Travancore and Cochin they were at low ebb. In Travancore and Cochin, political condition of the princely state weakened the possibilities of the spread of a strong nationalist movement and hence the rising middle class of both the upper and lower castes concentrated on promoting community interests (Kesavan, 1968: pp. 356-357). This was the background of the Izhava memorial, and the Abstention Movement of the 1930s, in which various deprived groups formed a coalition forum called Joint Political Congress to press forward their middle class demands for reserved representation in government jobs and legislatures in accordance with population strength against the huge monopoly of the Nairs and Brahmins. The non-cooperation or civil disobedience movements of the 1920s and 30s did not make any political effects here; politics of the princely states evolved around social issues, skillfully masterminded by caste/community organizations.

The nationalist movement came relatively late to "sleeping Malabar". While a District Congress Committee had been formed in 1908, it was not until 1916, with the beginning of the Home Rule Movement that Malabar began to awaken politically. The fifth Malabar District Conference was held at Manjeri in 1920 with Annie Basent in chair in which the extremist group could pass a resolution in favour of tenancy reforms against the moderate stand who under Basent boycotted the proceedings. The demands for tenancy reform came principally from the class of *kanakkar*, substantial tenants who were largely intermediaries between *janmis* and the vulnerable *verumpattakkar*, tenants-at-will. The *janmis* were mostly Nambutiri Brahmins, the *kanakkar* were disproportionately Nairs and the *verumpattakkar* were overwhelmingly drawn from the Mappila community and from Tiyyas, Cheruman and other depressed Hindu castes. The Nair *Kanakkar*, prosperous and articulate in defense of their interests, had long been active before government commissions and in the Madras legislative assembly in efforts to secure more favorable tenancy rights for themselves. But it was not until 1920, in linking the tenancy issue with the Congress-Khilafat struggle for Swaraj, that the tenancy movement gained momentum. The Congress was still a predominantly Hindu organization, dominated largely by Nair lawyers from the *kanakkar* class. The rise of the Khilafat issue[10] and Gandhi's decision to link it with the noncooperation movement fundamentally transformed the character of the Congress (Nambutiripad, 2005: p. 42)[11].

Non-cooperation was formally launched on August 1, 1920, and on the 18th of that month Gandhi and Shaukath Ali visited Calicut to bring its message. Khilafat committees began to sprout in Malabar and official reports revealed that Mappilas of Ernad were more interested in the tenant cause and only on upholding that issue the agitators could make any advance (Tottenham, 1922: p. 4). Agrarian tension increased in the light of the rumor of an impending tenancy reforms in Malabar and while landlords increasingly evicted tenants, Nair leaders of the Congress sought to mobilize the active support of the Mappila cultivators—both for tenancy reforms and in the name of Khilafat. Intense campaigning for Khilafat scared the official circles, in the light of "fanatic outbreaks" of the past, and ignorance and backwardness of the Mappilas, which led them to ban public meetings (Madras Mail, 1921, Feb. 8: 9; Ap. 27: 8); expansion of the tenancy movement under Congress auspices spread alarm among landlords and officials alike. In the context of all these the All Kerala Provincial Congress was held at Ottappalam on 26 April 1921, in which large number of Khilafat volunteers in uniform attended (Panikkar, 1989: p. 132) and an *ulema* conference exhorted all Muslims to support the Khilafat as a religious duty and to join the Congress to fight for the Khilaft through the struggle for swaraj. A tenants' conference convened at Ottappalam strongly supported resistance to land-

[10]The Khilafat movement sought to preserve the integrity of the Ottoman Empire and the Turkish Sultan as the Caliph. The movement beginning in 1919, protested against British support for the dismemberment of the Ottoman Empire and the abolition of the Caliphate. The Indian movement was led by the Ali Brothers (Shoukath and Muhammad) but Congress soon supported the issue as Gandhi saw in it a golden opportunity to weld Hindu-Muslim unity and combine anti-British issue of Khilafat with the movement for Swaraj through non-violent noncooperation.

[11]E.M.S. wrote that a striking solidarity had developed between the Mappilas and the class of lawyers, journalists and politicians (i.e., Congressmen) who brought them into nationalist politics; both were lured by tenant interests, and looked forward to get a tenancy legislation passed.

lords and Government in the form of noncooperation (Hardgrave, 1977: p. 70). Congress leaders like K. P. Kesava Menon and K. Kelappan addressed several Khiafat conferences (Menon, 1986: pp. 82-83). The "wonderful" organization of the Khilafat movement (Madras Mail, Aug. 8, 1921: p. 6) and the traditional system of communication among the Mappilas (Hitchcock, 1925: p. 3), along with the official anxiety over the Mappilas utilizing the newly forged solidarity to redress their immediate grievances (Tottenham, 1922: p. 26) forced the government to take strong punitive measures against them which, within a few days, led to the eruption of a violent uprising.

The rebellion actually started with the Tirurangadi incident in which nine Mappilas were killed in police firing while a group of 2000 people marched to the police station demanding the release of their fellowmen taken into custody during a police action at the Mambram mosque in search of some Khilafat volunteers (Hitchcock, 1925: pp. 31-34). Thereafter violence erupted which was marked by widespread attack on symbols of government authority, such as police stations, courts and record offices and cutting of railway and telegraph lines. Landlords-Nambutiris and Nairs—were the principal victims of the attacks, several of whom fled from the area to the nearby towns of Calicut or Trichur. At the earliest stages, Hindus were clearly involved, but with time and growing violence (and with the proclamation of the Khilafat kingdom in south Malabar), their numbers rapidly diminished (Hardgrave, 1977: p. 83), which imparted a communal color to the rebellion. For almost six months the "Mappila zone" was under the control of the rebel leaders. The government soon resorted to reinforcements which led the rebels to retire into safe areas and to fight a guerilla war. There were frequent reports of rebel atrocities, sporadic incidence of violence against Hindus and cases of forced conversions to Islam (Nair, 1923: pp. 76-79)[12]. This has been attributed primarily to two factors: the impression among many rebels of the movement leading to the establishment of an Islamic state and to the widespread suspicion of Hindus acting as informants for the government (Panikkar, 1989: pp. 179, 198). By the beginning of 1922 the rebellion was crushed causing heavy casualties on the rebel side and all the leaders were soon arrested or shot dead[13]. Panikkar identified at least three patterns of rebel activity in the whole course of the rebellion. The initial political mobilization was effected by the Khilafat and Congress activists who were soon rendered ineffective and the actual course of the revolt thereafter developed outside the political movement in which it had initially developed. In this second, but short-lived, stage the locally influential leaders took over the direction of the rebel proceedings but ceased to be effective when the army operations began. In the third and crucial stage, the insurrection was now conducted by the rural poor themselves, either under grass-root level leadership or without any recognizable leadership at all. The pattern of rebel proceedings underlined a consciousness primarily rooted in an opposition to the landlord and the colonial state. Against the selective and limited nature of rebel violence (against the janmis and their servants) of the nineteenth century, in 1921 a distinction was made between the lenient and exacting landlords (although attitude towards Europeans was uniformly hostile); several of the latter category were executed and murders and physical assaults on others were largely punitive actions against collaborators and informers of the British army (Panikkar, 1989: pp. 198-199).

In the context of the eruption of violence and the evolution of the revolt into a communal outbreak the Congress withdraw its support to their earlier ally, the Mappilas. The Congress leaders were in fact taken by surprise at the unexpected developments. But their activity was confined to the two trips they made to the rebel area in the early stage of the rebellion; afterwards they remained passive spectators-partly because they could not approve of the rebel action and partly because of their lack of confidence in being able to influence the rebels (Panikkar, 1989: pp. 149-151). The attitude of the Congressmen drove the Mappilas to identify the Congress with the Hindus (Panikkar, 1989: p. 189). The relief and reconstruction measures undertaken after the rebellion also underlined the communal divide—the Congress was active only among the Hindu refugees. The years that followed the suppression of the Rebellion and the withdrawal of the non-cooperation movement made it extremely difficult for the Congress organization to function in Malabar. K. P. Kesava Menon, the Congress leader, described the situation thus: "For a long time after the rebellion no public activity was possible in Malabar. Enmity towards the Congress was evident everywhere. The authorities stated that the Congress had brought down calamity on the country through participation in the Khilafat agitation. They even wanted all the Congressmen in Malabar to be imprisoned. The Muslims complained that those who had induced them to join abandoned them when police oppression and firing by the troops started" (Menon, 1986: p. 128). The caste-Hindus who were opposed to the Congress, on the other hand, denounced them for supporting the "foolish" and "fanatic" Mappilas and for inciting them to plunge into a violent action (Yogakshemam, 1921, 11: 47, 2). The Congress leadership sadly realized that the first political struggle it undertook in Kerala ended in tragedy and the alliance with the Mappilas proved self-annihilating as they not only not refused to adhere to Gandhian ahimsa but advanced it into a class and community struggle. More disturbing was the sense of unity evinced by the Mappilas and their resolve to sacrifice for a cause which was alien to the Hindu tradition and hence incompatible to "national" interests.

The Congress could not recover from the fatal blow inflicted on its morale by the rebellion for long; it could not think of political campaigning—even to summon a Congress meeting. It tried to overcome this political lethargy by focusing on the social front and by drifting towards political journalism. This was the background of the birth of the nationalist newspaper *Mathrubhumi* and the launching of the Vaikam satyagraha (Menon, 1986: pp. 139-149; Gangadharan, 2008: p. 248; Nambutiripad, 2005: pp. 65-68)[14]. The temple entry movement in fact

[12]The pro-British *Madras Mail* was in the forefront in this venture. The anti-Mappila reaction was presented by the *Mail* in its daily reporting and in a (later) series on "The Moplah Rebellion". It referred to the "innate characteristics" of the Mappila as "his mad fanatical fury, his murderous spirit and his reckless disregard for life" (Madras Mail, 1921, Nov. 14: 5; Nov. 15: 7). Gopalan Nair's *Malabar Rebellion* devotes 21 pages to atrocities allegedly committed by the Mappilas against the Hindus (Nair, 1923: pp. 52-72).

[13]Official figures recorded 2339 rebels killed, 1652 wounded and 5955 captured. K.P. Kesava Menon estimated that as many as 10,000 may have lost their life in the rebellion (Menon, 1986: p. 116).

[14]Mathrubhumi Daily was started in 1923 from Calicut with K. P. Kesava Menon as its founder editor. Congress leaders and people sympathetic to the nationalist movement helped to raise the necessary funds. It consciously tried to propagate nationalist and patriotic sentiments as well as a spirit of Hindu unity.

provided the Malabar Congressmen with a programme, and a lease of life, as it opened before them a safe field of activism; it shifted the centre of activity to further south where Mappilas were absent and furnished with a fine opportunity to compensate for the earlier "disastrous" alliance with the Mappilas by fighting for a Hindu cause (Jeffrey, 1978a: pp. 153-154)[15]. The Congress was turning more Hindu and more rightist; communities of foreign religious affiliation were increasingly identified as external to the national self and as threatening "national" interests.

The Temple-Entry Movement

The political and social atmosphere of Kerala in the 1920s and 30s grew tense with the Indian National Congress upholding the cause of temple entry. In 1924 the Congress organized the vigorous 20 month long satyagraha at the Vaikam temple with the simple aim of securing the right to use the approach roads of the temple for the untouchables. While the upper castes and non-Hindus including Christians and Muslims freely used the temple roads, the untouchables like the Izhavas and Pulayas were forbidden to pass through them. The Izhavas were on the verge of a revolt over the question of caste pollution and viewed it as an obvious act of social injustice and open violation of human rights. The S.N.D.P. Yogam was seriously discussing the means to overcome this social stigma. Since the Izhavas had their own temples in which they themselves acted as officiating priests, their eagerness to get access to *savarna* temples was more a matter of civil rights than a question of freedom of worship. T. K. Madhavan, the prominent leader of the S.N.D.P. Yogam and the true spirit behind the satyagraha, managed to get a resolution passed at the Congress session in 1923 at Kakinada on the question of the removal of untouchability. The Kerala Pradesh Congress Committee (KPCC) decided to launch a satyagraha at Vaikam on this basis (Menon, 1986: pp. 160-164). Gandhi blessed the satyagraha but cautioned against non-Hindu participation and non-savarna leadership in it as it was strictly a Hindu cause and a golden opportunity for caste-Hindus to atone for a heinous sin (Young India, 1925: p. 135; Proceedings, 1925). The satyagraha attracted countrywide attention and people from all over India reached Vaikam to support the struggle. The *savarna-jatha* (upper caste march) organized under the leadership of Mannath Padmanabhan to the capital Trivandrum, to impress upon the king of the urgency of the demand, truly reflected this spirit. The prolonged campaign and the direct involvement of Gandhi forced the authorities to come to a settlement according to which all the approach roads, except the eastern one, of the temple were thrown open to all people irrespective of caste and community. The modalities of the agreement was a subject of intense debate and the Congress was blamed for deserting the struggle halfway and for effecting the agreement only to the Vaikam temple (Ravindran, 1988: pp. 144-149). Due to this reason, several similar struggles had to be waged for the same purpose subsequently. As a result, in 1928, approach roads to all temples in Travancore were thrown open to all people (Menon, 1984: p. 327).

The second satyagraha struggle under the K.P.C.C. against caste based pollution, but now to get the temple open to all Hindus, was organized in 1931-32, in the course of the C.D.M, at the Guruvayur temple in Malabar. While the struggle at Vaikam was a social reform measure divorced from any political movements, at Guruvayur it was integral to a political program (Gopalankutty, 1981). Nevertheless, in Kerala, the zeal for social reform overshadowed the rising countrywide political enthusiasm; for the K.P.C.C. the temple-entry issue was more important than the C.D.M. and leaders like Kelappan concentrated heavily on the question of untouchability (Mathrubhumi, 1931, Ap. 6, June. 21, July. 29, July. 31 & Sep. 10; 1932, March. 5, March. 27 & Aug. 4). Gandhi also asked the satyagrahis to detach the struggle from all its political affiliations and from the organizational links of the Congress in order to rescue it from government repression and to ensure its success. Though the temple-entry agitation was perceived as tantamount to the "struggle against imperialism" by some of its leaders (Gopalan, 1973: p. 28) as it kept vigil against disunity and factionalism, what really prompted the Congress to confine the struggle to temple-entry was the bitter experiences of 1921[16]. The Zamorin, who was the trustee of the temple, however, refused to step down to negotiate a settlement which led Kelappan to start a fast unto death which, however, was withdrawn under the advice of Gandhiji (Mathrubhumi, 22 Sep. & 4 Oct. 1932). The satyagraha as a whole was finally terminated before achieving any of its declared objectives. A period of three months was given to the Zamorin to effect temple-entry, failing which Gandhi would himself offer satyagraha; but it was postponed and did not take place at all. A referendum was held among the caste Hindus of Ponnani taluk, where the temple was situated, which revealed that 70% of them supported the cause of temple entry (Mathrubhumi Weekly Temple Entry Special Issue, 16 Nov. 1937). N.P. Damodaran, one of the leaders of the satyagraha, later recollected that though the agitation failed to meet its immediate objective, it created a climate in favour of temple entry (Damodaran, 1981). The movement for temple entry registered its crowning victory when the Travancore government made the temple entry proclamation in 1936 by which all temples in Travancore were thrown open to all Hindus (Menon, 1984: pp. 327-328). Nevertheless, the temples of Cochin and Malabar remained closed before the *avarnas* till 1947.

Politics of the Temple-Entry Movement

The temple-entry movement was important for several reasons. Firstly, it was a conscious effort on the part of the Congress to integrate the various castes and communities under the Hindu fold through social and religious reform, which represented a powerful domain of the nationalist movement. Temple could rally diverse sections together without dislodging the existing power relations and a symbolic unity could pacify lower caste radicalism. The Congress decision to take up the issue in Kerala was certainly in the context of the inclusion of the removal of untouchability as part of the Gandhian constructive program and its decision to fight out social evils in accordance with the nation-building project, but the constructive

[15]In an interview K. P. Kesava Menon revealed that for the Congressmen from Malabar district, the temple-entry campaign gave an opportunity to revive interest—at a safe distance—in a Congress that had suffered a severe setback with the Mappila rebellion of 1921 (cited in Jeffrey, 1978a: pp. 153-154).

[16]The fear of the Mappilas loomed large even in the 30's and during the salt march it is reported that salt law had been broken all over Malabar except in the erstwhile "rebel" areas. Moreover, the procession on foot from Payyannur, heading for the Guruvayur satyagraha stopped short of the "rebel" area. The marchers took a train from Feroke to Tirur "because of a rumor that the Mappilas would prevent them from moving into Ernad" (Menon, 1994: pp. 103-104).

programme itself betrayed its elitist character (Kooiman, 1995: p. 45; Onwerkerk, 1994: p. 56). Writings of Gandhi in the early twenties, and even later, revealed how the Congress leadership was getting seriously troubled by lower caste radicalism and the increasing volume of religious conversions (Young India, 27.10. 1920: 135; 04.06.1925: 135; 19.01.1921: 6; 04.05.1921: 3; 27. 04.1921: 5; 22.09.1921: 11; 29.09.1921: 12; 13.10.1921: 13; Harijan, 11.02.1933; 31.10.1936)[17]. Of equal importance was the basic limitation of the anti-untouchability program: it searched for a moral solution to repair inequalities to recast the nation but without dislodging the basic social structure[18]. The Congress leadership in Kerala also refused to address the economic content or power relationships rooted in it but rather took it as a question of equality within religion and an unfortunate aberration from scriptural injunctions.

Secondly, the heated debates unleashed by the Izhava middle class on religious conversion was acquiring political and economic dimensions. C.V. Kunhuraman, the firebrand leader of the S.N.D.P. and the editor of *Kerala Kaumudi* had made the alarm signal by urging the Izhavas to renounce Hinduism if the upper castes did not support their cause of temple entry (Kunhuraman, 1936). A section of the Izhavas enthusiastically welcomed the suggestion. Though there were differences of opinion as to which religion they should opt—whether Christianity, Islam or Buddhism—the challenge fell like a bombshell on the *savarna* groups. Although conversions had been taking place among the untouchables from very early times and its pace had considerably increased by the nineteenth and early twentieth centuries, the '20s and '30s were special because now the challenge came from the Izhavas who though "are *avarnas* are rich and educated" (Kelappan, 1925). The loss of the middle class was exceptionally harmful as they could threaten—as in the case of the Christian middle class of central Travancore (Jeffrey, 1978a: pp. 153-154)—the material pursuits of the upper caste Hindus. A powerful section within the S.N.D.P—including Kumaran Asan, T. K. Madhavan and A. Ayyappan, and of course Sri Narayana Guru too—stood for a reformed Hinduism (Kesavan, 1968: pp. 274-276). But radicals held fast to the idea of conversion; preferably to Buddhism against the Sri Lankan background of the Izhavas (Kunhuraman, 1925); this had lent space to speculations, that the conversion issue was a pressure tactic to enforce a reform of customs. However, it had its desired effect: caste Hindus increasingly began to realize the need of ritual reform which is evident in the rhetoric against conversions with a stress on the innate quality of Hinduism (Thampan, 1932; Nambutiripad, 1932). The Nair aristocracy fanned Nair communal passions against the Christian capitalists who were buying up their land and prestige (Isaac & Tharakan, 1988: p. 166). Leaders like "Mannam, who was not a Gandhian and was in general opposed to the Congress", participated in the Vaikam Satyagraha for his concern over the loss to Hinduism of converts to Christianity (Onwerkerk, 1994: p. 59). The temple entry movement under the leadership of the Congress thus represented an attempt at forging a consolidated Hindu identity and to discourage conversions which was engendered by disabilities enforced by the caste system. Religious conversion could cause trouble to the caste Hindus because "it reduced their rhetorical constituency" (Jeffrey, 1978a: p. 143). The writings of Kelappan clearly demonstrated how the temple-entry movement was directly linked to the threat posed by religious conversions (Kelappan, 1925; 1932a; 1932b)[19].

Thirdly, the Congress interest in the temple-entry struggle was an attempt to offset the damage caused to its prestige and honor by the incidents of 1921. Congress leadership tried to escape from the initial shock by expressing its "firm conviction" that the non-cooperation and Khilafat movements were in no way responsible for the outbreak. The Congress view was recorded in the resolution of the Working Committee in September 1921, expressing a "sense of deep regret over the deeds of violence done by the Mappilas in certain areas of Malabar" and resolved that the rebellion was not caused by the Khilafat or Non-cooperation movements, and that the causes of the rebellion had nothing to do with these movements (Sitaramayya, 1946: p. 216). Prominent Congress leaders in Kerala shared this view as is understood from Kesava Menon's comment that "it was wrong to have connected the Khilafat problem with the Nationalist Movement" (Menon, 1977: p. 48). Congressmen in Kerala were under siege for upholding the Khilafat issue and forging an alliance with the "fanatic" Mappilas which brought about "great hardships to the Hindus and dishonor to the land". The committees appointed by the Congress failed to make a comprehensive and objective enquiry into the cause of the rebellion, which led to develop controversies with strong political and communal overtones. K. Moidu Maulavi, Khilafat leader and staunch nationalist, reiterated his firm conviction that the rebellion was a struggle for freedom, it started as an anti-imperialist rising, although "in the end the British authorities had succeeded to an extent in degrading it into a communal conflict" (Maulavi, 1981: pp. 136-141; 152-154). But Kesava Menon stated (later) that it would not be correct to consider the "Mappila Rebellion" as part of the Nationalist movement because the rebels "were motivated more by religious zeal and

[17]In a series of articles entitled "The Removal of Untouchability" wrote in *Young India* and *Harijan*, Gandhi viewed conversion rather more inspired by the desire for material benefits than for spiritual needs. The lower caste people were getting converted because of untouchability which has to be eliminated not only to cleanse Hinduism of its evils but to attain swaraj also. Foreign rule in India is a divine punishment for following this curse which "is a crime against god and humanity". In fact untouchability was not a part of original Hinduism and hence those who threaten to abandon Hinduism are deceiving their religion. He consoled the untouchables that their low social stature is not due to their fault and urged the *savarna* people to take up the removal of untouchability as an act of atonement before they were too late to do so.

[18]"Untouchability was both a moral and political problem: the former because its eradication involved undermining its moral legitimacy and changing, or at least softening, Hindu attitudes; the latter because it was deeply rooted in the highly unequal structure of power relationship between the upper castes and the harijans and could not be removed without restructuring it. It had therefore to be fought at both levels. Gandhi's campaign was conducted only at the moral and religious level. Hence he concentrated on caste Hindus…, appealed to their sense of duty and honor, mobilized their feelings of shame and guilt, and succeeded in achieving his initial objective of discrediting untouchability and raising the level of the Hindu… consciousness. Since he did not organize and politicize the harijans, stress their rights and fight for a radical reconstruction of the established social and economic order, Gandhi's campaign was unable to go further" (Parekh, 1989: pp. 245-246).

[19]K. Kelappan, the great Gandhian Congressman and the foremost champion of the temple-entry movement in Kerala, in his article on the Vaikam Satyagraha (1925: pp. 42-45), justified the struggle in the context of the increasing tendency of the lower castes, especially Izhavas, to renounce Hinduism. In another article written around the time of the Guruvayur Satyagraha, he expressed great concern over the harms caused by conversions. This article is specially noted for his attitude of the Muslim "other"; they are perceived as a threat to the nation and national unity; mainly because of their solidarity and stress on international brotherhood (1932a: pp. 7-8). He also suggested a "secular" programme the government should follow to curb the growth of (Muslim) communalism (1932b: pp. 4-5, 10).

interest in the Khilafat than by true national consciousness" (Menon, 1977: p. 48). In their highly illuminating accounts of the event, two other prominent Congress leaders—K. Madhavan Nair and Mozhikunnath Brahmadathan Nambutiripad—traced the origin of the rebellion back to the high-handed British policy of repression (Nair, 2002; Nambutiripad, 1965). By attributing the violence of 1921 to the official atrocities, they justified the decision of the Congress to ally with the Mappilas but regretted for associating with a group still unfit for a modern and secular political struggle—and thus justified the official Congress position rejecting the struggle as a part of the national movement. They also shared the colonial perception of the uprising as nothing but a "riot" and treated the Mappilas as "wild" and "fanatic" people who could not be trusted or easily tamed.

Neither did the rebellion confine its impact to Malabar politics alone. The widespread propaganda recounting awesome details of the "Hindu suffering" at the hands of the Mappila rebels gave birth to an aggressive Hindu campaign, at first against the "cruel Mappilas" and later against Muslims in general. On the other hand, the sufferings of the Mappilas deeply moved Muslims all over India. Frantic appeals for helping them received generous response from the North. All these affected the relationship between the Hindus and Muslims all over India. "The exaggerated tales (about the rebellion)… inflamed feelings. The cry of Hinduism in danger was raised and movements of *Shuddhi* (reconversion) and *Sanghathan* (organization) planned. A vicious cycle of accusation and counter-accusation was set up which created the heat in which the tender plant of Hindu-Muslim unity began to wither" (Chand, 1972: p. 497). The "communal antagonisms generated by the Malabar Rebellion" (Brown, 1972: p. 329) and the steadily advancing nationalist discourse centered on religious and cultural nationalism greatly strengthened the concept of the Muslim "other" to the extent that even the great Izhava reformer and poet Kumaran Asan wrote a tale of the Rebellion villainizing the Mappilas in which he told the tale of a Nambutiri girl thrown desolate by the "cruel Muhammedans" during the revolt of 1921 (Asan, 1969). Similarly, in his "statement" attached to the 1970 edition of K. Madhavan Nair's *Malabar Rebellion*, K. Kelappan shared the concern of the Congress leadership towards the "minority Hindus of Ernad" against the "illiterate", "ignorant" and hence "rude" Mappilas (Nair, 2002: ix-xii)[20].

The fear of the Mappilas for their "lack of civility", the widespread concern over the hardships of the (upper caste) Hindus who had escaped from the affected areas to take shelter in the nearby town of Calicut or in the princely states of Travancore and Cochin, the cooperation extended by Congress to the relief measures undertaken by the Arya Samaj, which was also very active in reconverting the Hindus who were converted to Islam, (Ansari, 2005: p. 64) the total breakdown of the organizational structure of the Congress and its inability to carry on even normal political activity in the face of official retribution and popular distrust in its programs, all forced the Congress to retreat to a Hindu idiom of politics (Menon, 1994: p. 78). Gandhi's statement—"The Moplahs are Muslims"—reveals the stereotypical character-construct of the Muslim (Ansari, 2005: p. 73). The leadership of the Congress in Kerala could not get out of the shock inflicted by the events of the rebellion, especially the attack of the Mappila rebels on caste Hindus. This was not surprising because in Malabar caste system conformed to a kind of class order: the caste Hindus were the landlords or the prominent leaseholders of the area while the Mappilas were the sub-tenants under them (Panikkar, 1984). Among the higher castes in particular, it is observed, the attitude towards Islam was coloured by the way in which Islam impinged upon their interests (Misra, 2004: p. 20). That the lower caste tenants refused to rebel against their upper caste lords in Malabar clearly revealed the manner by which caste hierarchy and the mode of class response got enmeshed. The higher castes could realize that the threat posed by conversion to their interests could only be countered by bringing various caste groups together on some common issue and by reforming social practices which segmented them; efforts to forge a symbolic unity among Hindu communities around the question of temple-entry appeared a useful weapon to discourage the untouchable castes to get attracted to religions which promised to emancipate them. For the dominant groups, religion offers the necessary ideological justification for existing social divisions, makes these divisions appear non-antagonistic and holds together a potentially divided society into a single whole (Chatterjee, 1989: p. 172).

Thus, the championing of the temple-entry cause (mainly at Vaikam) provided the Congress with a big lease of life: it gave a platform for action with a strictly non-political program; it saved them from official surveillance as the centre of activity was shifted to the safe environs of the princely state of Travancore; it eschewed the fear of communal tension because the Mappila factor was absent in Travancore (Menon, 1994: pp. 103-104) and above all, it provided the Congress with an opportunity to expiate for the "sin" of allying with the "dangerous" Mappilas by upholding a "Hindu" cause. Congressmen played the role of an arbiter between various Hindu castes, which in fact signaled a retreat from secular political activity, but it opened before them a program of action after the "Mappila" rebellion (Menon, 1994: p. 80).

Conclusion

The temple-entry movement decided the future course of politics in Kerala at least in three respects. Firstly, it provided a conclusive end to the civil rights movement undertaken by the untouchable castes leading to the attainment of the right of universal temple-entry. The questions of religious disability and freedom of worship slowly subsided to become less and less powerful to command the discourse of civic life and political culture. The debates centered on religious conversion as a means of social emancipation also faded out altogether (Isaac & Tharakan, 1988: p. 168; Narayanan, 2011). The (upper caste) leadership of the Congress was able to coerce the caste-Hindus to compromise on the question of temple-entry as the only viable means to ward off religious conversion which challenged the very survival of the Hindu community. Secondly, with the success of the temple-entry agitation the conversion movement certainly began to wane in Kerala, but it greatly undermined the secular image of the Congress for its propagandist role in dis-

[20]Chatterjee (1995: p. 126) writes that the fact that Indian nationalism is synonymous with "Hindu nationalism" is an entirely modern, rationalist and historicist idea. The notion of "Hinduness" is not defined by any religious criteria at all. There are no specific beliefs or practices which characterize this "Hindu" and the many doctrinal or sectarian differences among Hindus are indifferent to this concept. Even anti-Vedic and anti-brahmanical religions as Buddhism and Jainism count here as "Hindu". Clearly excluded from this *jati* are religions like Christianity and Islam. The criterion for inclusion and exclusion is determined by their historical origin. Buddhism and Jainism are 'Hindu' because they originated in India while Islam and Christianity originated outside and are, therefore, foreign.

seminating the so-called "Essentials of Hinduism" and in seeking to forge a (Hindu) "community of equals" (Menon, 1994: p. 80) through a common bond of religiosity and uniformity of religious worship around temples. In that sense the temple-entry movement marked a definite stage in the process of the disjunction of folk religion and other currents of religion. Religion is no longer divided into lower religion and higher religion, but into religion and superstition (Sontheimer, 1995: p. 396). Hence it was a *shuddhi* movement—to cleanse religion of blots identified incompatible with modernity and the essentials of nationhood. The temple-entry satyagraha attains significance against the dual task taken up by the Indian National Congress —to construct a modern nation-state and to mould a national (Hindu) religion. But it had its disastrous consequences—in driving religious minorities away from the organizational fold and ideological appeal of the Congress. The bitter experiences of 1921 followed by the conscious involvement of the Congress in the affairs of religious nationalism forced the Mappilas to keep away from nationalist politics and slowly drift towards a marked sectarian identity. The slow but steady drift of the Mappilas into communal politics became inevitable (Panikkar, 1989: p. 190). Thirdly, the struggle for temple-entry helped in delivering the Congress from the moral setback it faced after the Malabar rebellion, but in the unique social context of Kerala where reform movements had succeeded in shaping an ideological environment in favor of social equality, its withdrawal from direct politics to engage with socio-religious issues, disregarding more important questions of material deprivation and class disparities, transcending caste/religious affiliations, reduced its political constituency and created a fertile ground for the proliferation of left political ideology in subsequent times. Moreover, in the 1930s, the strong communal and caste consciousness let loose by the agitation against caste disabilities could lead the poor towards class consciousness (as caste roughly coincided with class in Kerala). With the Temple entry Proclamation in Travancore in 1936—"the final act in the embourgeoisment of society" as Nambutiripad saw it (Jeffrey, 1978: p. 82)—the middle class members were accorded the right to use temples and abruptly lost interest in the poor of their own caste. But the political excitement awakened among the poor and low caste could not be made to go away; it lay ready to be developed into class consciousness.

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Communities Inferred from the Books of Samuel in the Old Testament of the Bible

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The books of First and Second Samuel are part of historical books in the Old Testament of the Bible, which appear as a single book in Jewish scriptures. These two books record the critical transition of governing system in Israel from judges to kings and from 12 tribes to a centralized state. The three major characters in these books are Samuel priest, prophet and the last judge, Saul the first king of Israel, and David the second king, a man after God's own heart. These books contain many fascinating stories that present the life of Samuel, the rise and fall of Saul, the long journal for David to become king, and the establishment of his kingdom. In this study, we constructed a sequence of social networks from these two books based on the interactions of many characters and their locations. Our aim was to apply a computational approach to identifying the communities in these networks, which summarized the interactions between the key figures and others, along with their locations. As a result, the rich information of this part of Israel history was encoded and visualized concisely through this sequence of networks of communities in time.

Keywords: Samuel; Bible; Community

Introduction

The books of First and Second belong to the historical books of the Bible that record the history of the Israel, covering the time of this nation from conquering Canaan the promise land to the loss of this land through the Babylonian exile because of their disobedience to God (Payne, 1982; Magennis, 2011). These two books trace the social transition period of Israel from loosely organized 12 tribes to a centralized monarchy in the promise land, along with the political leadership change from tribal judges to kings. They provide a natural continuation of the book of Judges reflecting from the content overlapping between the start of the First Samuel and the end of the book of Judges. The time of the judges was a chaotic era in the history Israel since there was a repeated pattern of rebellion, oppression, and deliverance. In those days there was no king in Israel, but every man did that which was right in his own eyes (Judges, 17: 6). When Samuel, their prophet, priest, and the last judge, was quite old, the Israelites demanded a king, similar to the kings of the surrounding nations. However, the whole purpose of God creating the nation of Israel is to make this nation to be unlike all other nations (Exodus, 19: 5-6), as God Himself was the ruler, king, and God of Israel. Moses predicted Israel's desire for a human king in (Deuteronomy, 17: 14-20), but the human kings must serve as representatives of God's kingship over Israel.

The unity of contents of the First and Second Samuel suggests these two books are one book in reality as seen from the original Hebrew text (Gordon, 1999). Further, such division appears in the other books of the Bible such as First and Second Kings and First and Second Chronicles. These books were named after Samuel, because his life formed the foundation of First Samuel and he was a partial author of the book. Samuel was not merely an editor and a character of this book, but the author of the history of this critical period of Israel, who played a pivotal role in rise of kingship of Israel (Tsumura, 2007). These books are not a narrative of historical events solely, but rather to elucidate the significance of the divine guidance of the nation Israel, revealing God is the real maker of human history.

These two books primarily chronicle the life of Samuel (1 Samuel, 1: 12), the reign of Saul (1 Samuel, 13: 31), and the reign of David (2 Samuel), since they were essential in the establishment of the monarchy. In particular, these books give a comprehensive account of the life of David, a man of faith even while a man of weakness, as illustrated from his victories and struggles and his trust and reliance upon God. As the youngest of the eight sons of Jesse, David was born in Bethlehem and served as a shepherd during his childhood. Besides being a great king, David was also well known as a great psalmist as well as a great warrior. The description of David in the Bible, as a man after God's own heart (1 Samuel, 13: 14), is more detailed than any other Bible character except Jesus Christ. Furthermore, the name David is the third most often used name in the whole Bible, with Moses and Abraham being first and second respectively. In the New Testament, Jesus is described as a "descendant of David according to the flesh" (Romans, 1: 3) according to God's Davidic covenant recorded in (2 Samuel, 7).

The birth of Samuel was God's answer to his mother's faithful prayer. From the tribe of Levi, Samuel was the maker of

Israel kings and played a key role as God's messenger and leader, who found and anointed both Saul from the smallest tribe of Hebrews, Benjamin, and David from the tribe of Judah. He guided Israel's transition to kingship and bridged the periods of the judges and the monarchy. In addition to these three main figures, there were three more important characters in First Samuel, who were Eli that raised Samuel and the high priest prior to Samuel, Hannah mother of Samuel, and Jonathan son of Saul. Other key figures in Second Samuel were Joab the general of David's army, Bathsheba wife of Uriah and afterward of David, Nathan the prophet, and Absalom son of David. Nonetheless, the books of Samuel were cogently organized into stories of Samuel, Saul, and David, covering approximately the time period from 1050 to 970 BC (Gordon, 1999).

The books of Samuel capture so many attractive storied occurred in the history of Israel that are among the most famous from the entire ancient world (Tsumura, 2007). To discover the patterns of interactions among so many characters in these stories, we applied a community detection algorithm to a sequence of social networks made from these books. Our aim was to gain new insight into these interesting books, as God's word is a lamp to our feet and a light for our path.

Materials and Methods

Materials

The text of the Bible used in this study is from the King James version (1611 authorized version), downloaded from http://printkjv.ifbweb.com. Because First and Second Samuel are used as data in our study, this section provides some background information about three major characters in these two books, Samuel, Saul, and David.

Family of Samuel

Hannah and Elkanah were Samuel's mother and father who lived at Ramah. Elkanah was a Levite. He had another wife Peninnah who had children but Hannah had no children at the beginning of the book of First Samuel. Samuel had two sons Joel and Abijah.

Family of Saul

Saul was son of Kish from Gibeah, in the tribe of Benjamin. His wife was Ahinoam daughter of Ahimaaz. They had four sons and two daughters. The sons were Jonathan, Abinadab, Malchishua and Ish-bosheth, and the daughters were Merab and Michal. He had additional two sons, Armoni and Mephibosheth, born from his concubine Rizpah daughter of Aiah.

Family of David

David was born in Bethlehem, in the tribe of Judah. His father was Jesse. He had eight wives: Michal, daughter of Saul, Ahinoam the Jezreelite, Abigail the Carmelite, former wife of Nabal, Maachah, daughter of Talmai, king of Geshur, Haggith, Abita, Eglah, and Bathsheba, former wife of Uriah the Hittite. David also had at least one daughter, Tamar by Maachah. He had six sons born in Hebron: Amnon by Ahinoam, Daniel by Abigail, Absalom by Maachah, Adonijah by Haggith, Shephatiah by Abital, and Ithream by Eglah. By Bathsheba, his sons were: Shammua, Shobab, Nathan, and Solomon. He had others sons born in Jerusalem by other wives.

Methods

Compared to random networks, real social networks exhibit several characteristic features such as small world, power law degree distribution, and community structures (Newman, 2010). A community in a network is a group of vertices that are densely connected inside the group but sparsely outside. In this study, we made use of Walktrap, a community detection algorithm, which relies on random walks on graphs to calculate a distance that could then be used to define the structural similarity between vertices. The advantage of the method is that this distance cab be computed efficiently. Finally, a hierarchical clustering algorithm is used to merge the vertices iteratively into communities. The intuition of this approach is that: random walks on a graph tend to get trapped into densely connected parts corresponding to communities (Pons & Latapy, 2006).

Division of First and Second Samuel into Segments

In order to make a sequence of social networks from the books of Samuel, we divided First Samuel into three logical segments, chapters 1-8 presenting the birth and life of Samuel and serving as an important preface for this book, chapters 9-15 describing the rise and fall of the first king Saul, and chapter 16-31 depicting God's choice of David to be Saul's successor, and David's long journey for accession to the throne. Similarly, Second Samuel was partitioned into four segments, chapters 1-4 showing David's victory over the house of Saul to become king of Judah, chapters 5-10 presenting the success of David's rule as king of all Israel, chapters 11-21 telling David's sins and their punishments, and chapters 22-24 covering David's faith, thanksgiving, and sin.

Social Network of First and Second Samuel

To gain a global perspective of First and Second Samuel, we present the Meta data of the social network made from the two books, including the appearances of Samuel, Saul, and David in each chapter, the social network from these two books, top 30 vertices of highest degrees in the network, and the histogram of degree distribution of all vertices in the network (**Figures 1-3**). The social network of First and Second Samuel displayed three characteristic traits of a real social network: small world with average geodesic distance of vertex pair = 1.847, power law degree distribution (histogram in **Figure 3**), and communities structures (**Figure 2**). The histogram in **Figure 3** suggested that vertices with small degrees are most frequent in this network.

Results

We present the communities found in a sequence of social networks from the segments of the books of Samuel as described in Section 2. With different colors these communities visualized the interactions of different characters and their locations, thereby rendering this part of Israel history with a sequence of networks of communities in time with a sense that a picture is worth a thousand words (**Figures 4-12**). Additionally, to give a quick summery of the chapters in each segment, the word clouds of top 50 most frequently occurred words in these chapters are displayed next to the network of the same chapters (**Figures 4-12**).

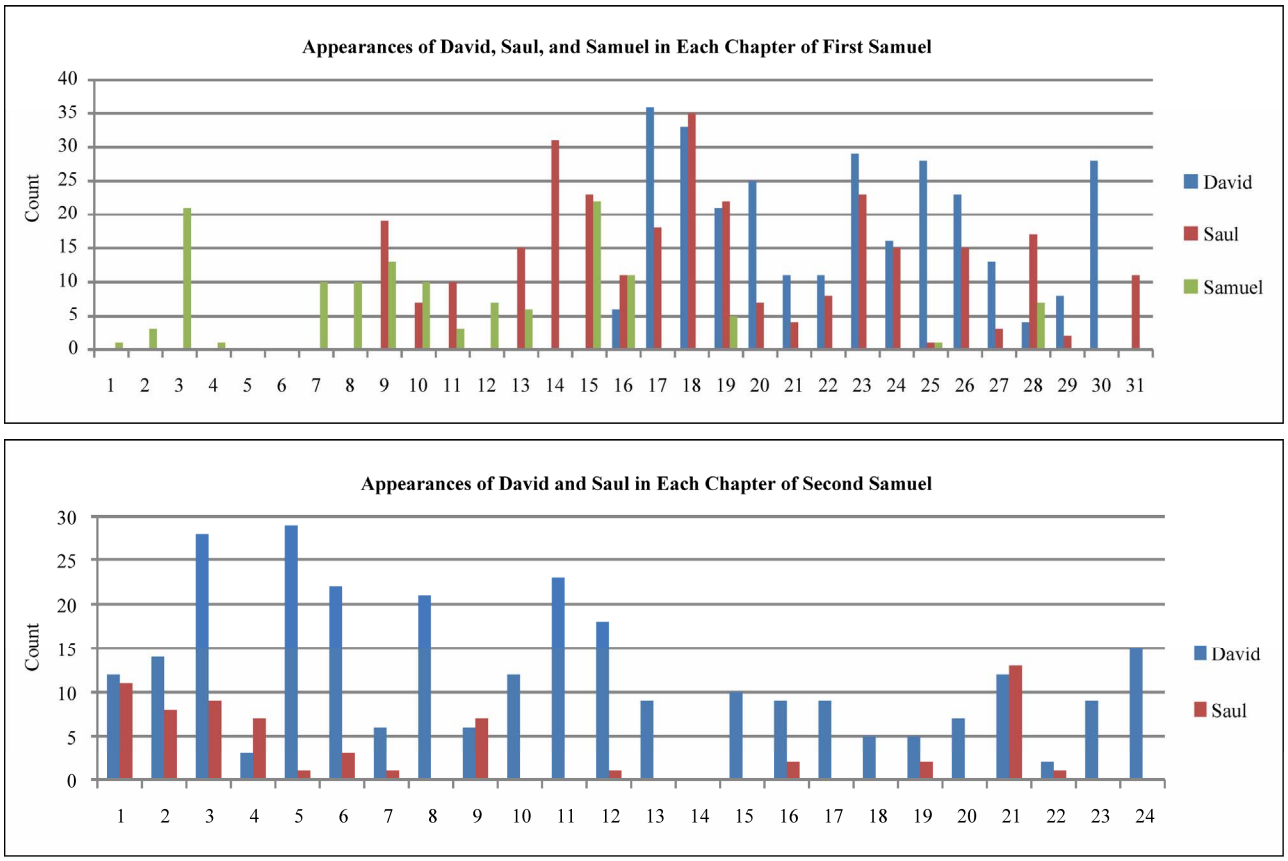

Figure 1.
Appearances of Samuel, Saul, and David in each chapter of First and Second Samuel.

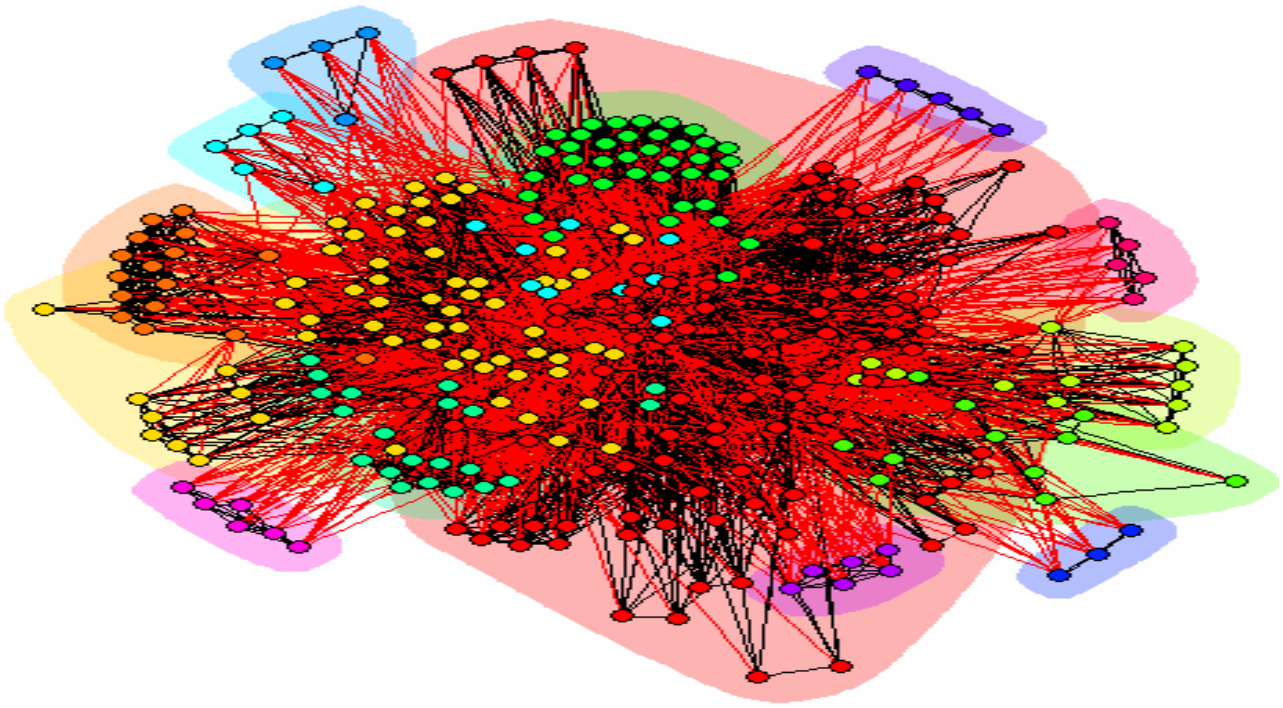

Figure 2.
Social network made from First and Second Samuel with 300 vertices, 8692 edges, and average shortest distance of vertex pairs = 1.847.

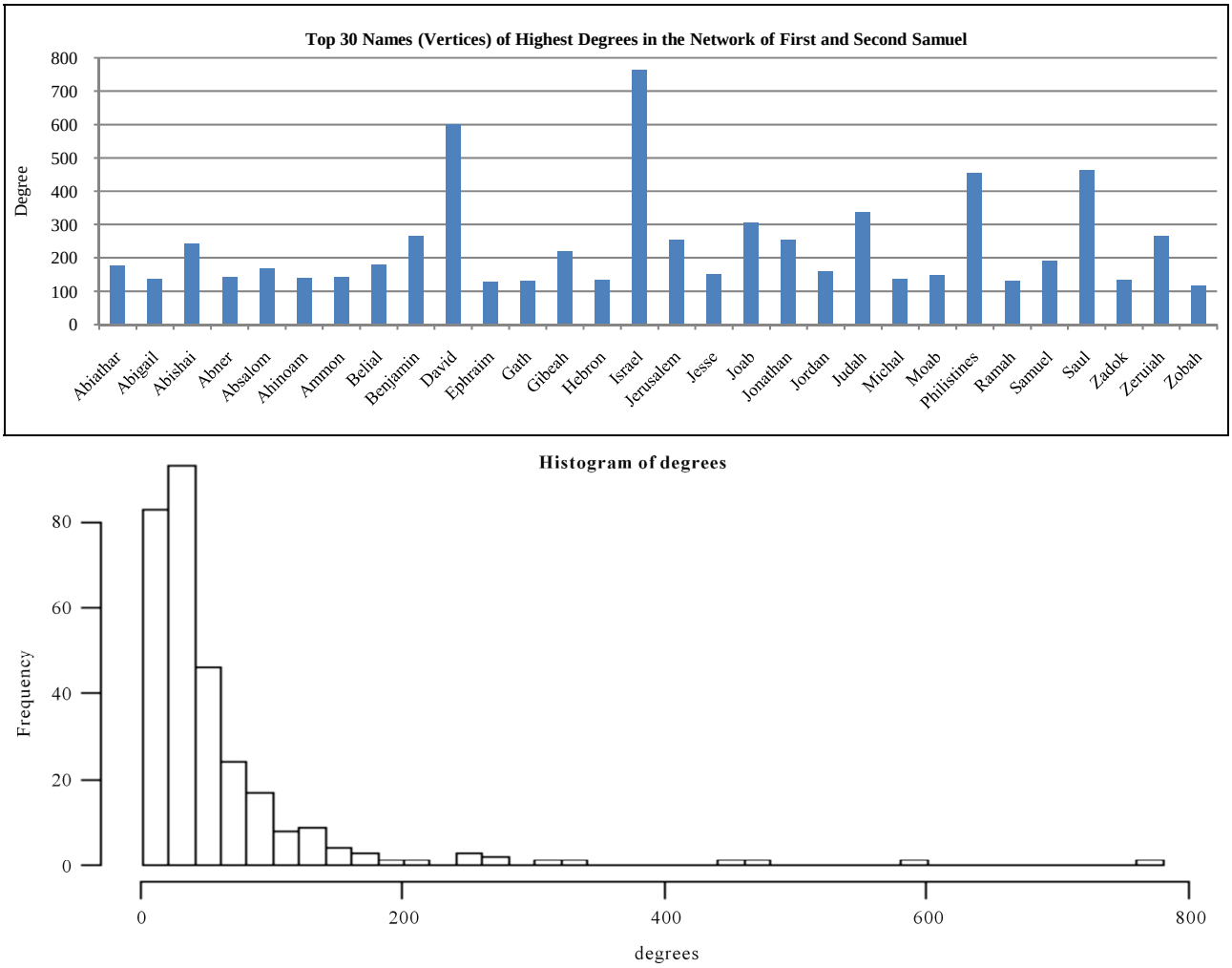

Figure 3.
Top 30 vertices of highest degrees and histogram of degree distribution with bin size = 20 in the network of First and Second Samuel.

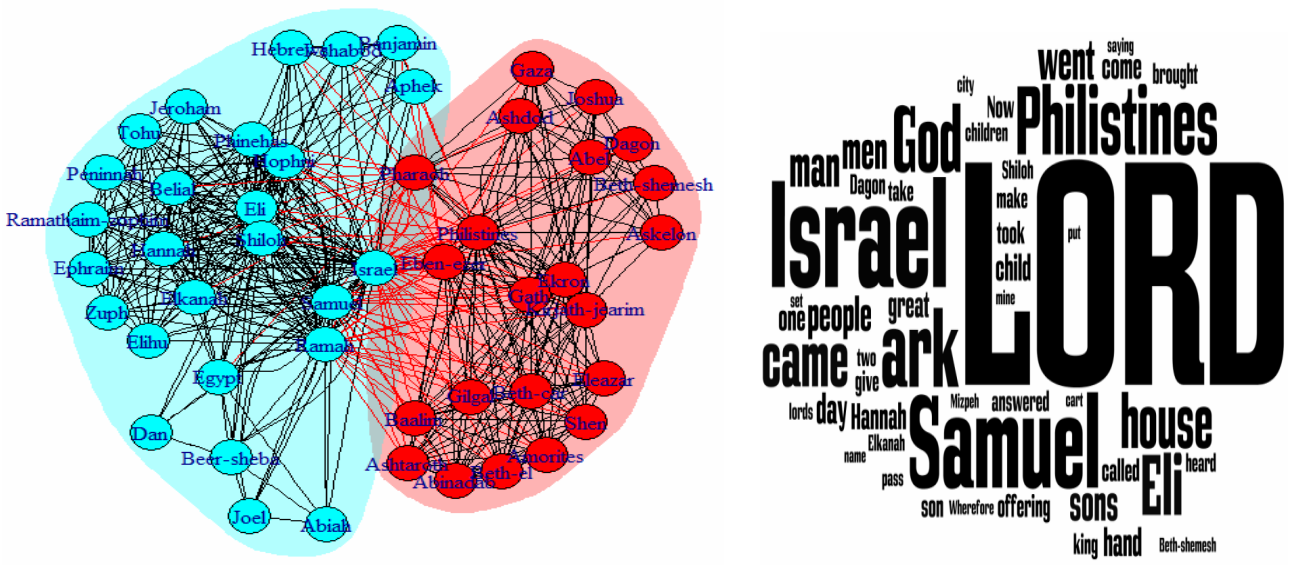

Figure 4.
Communities in the network of chapters 1-8 (left) and word clouds of top 50 most frequently occurred words in these chapters (right).

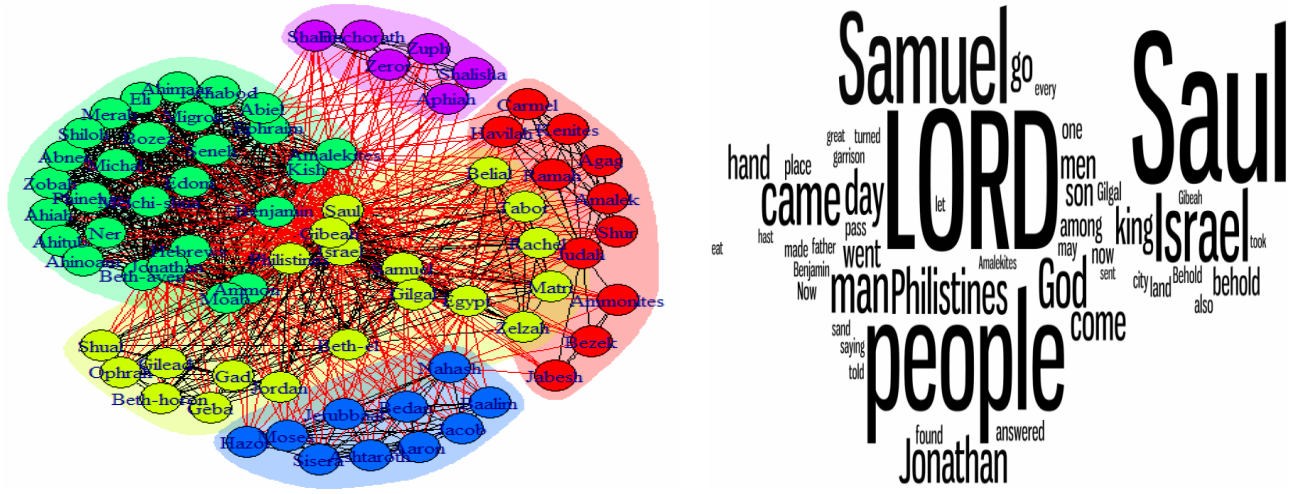

Figure 5.
Communities in the network of chapters 9-15 (left) and word clouds of top 50 most frequently occurred words in these chapters (right).

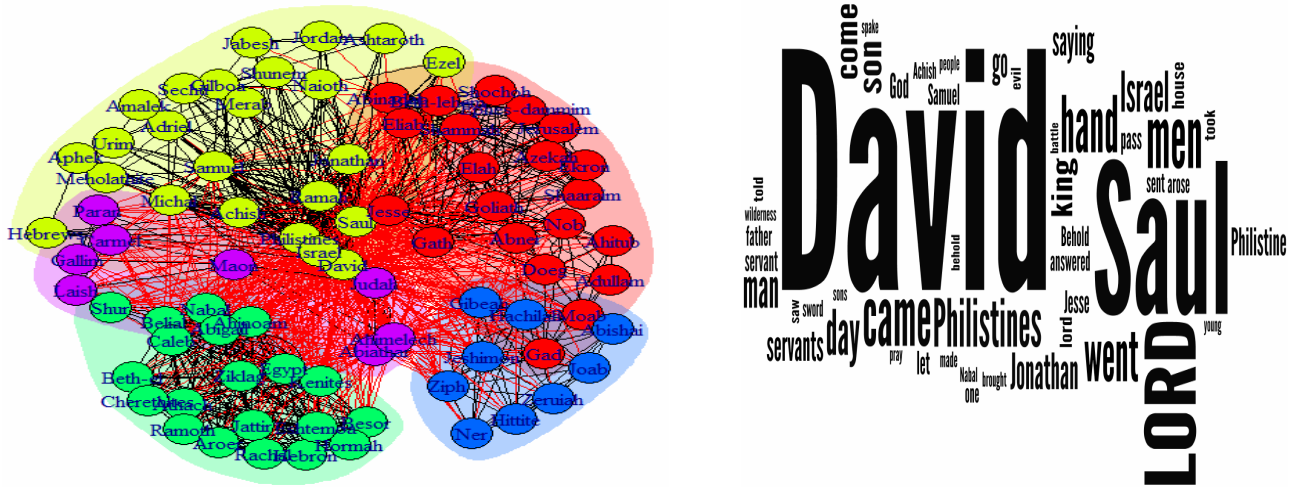

Figure 6.
Communities in the network of chapters 16-31 (left) and word clouds of top 50 most frequently occurred words in these chapters (right).

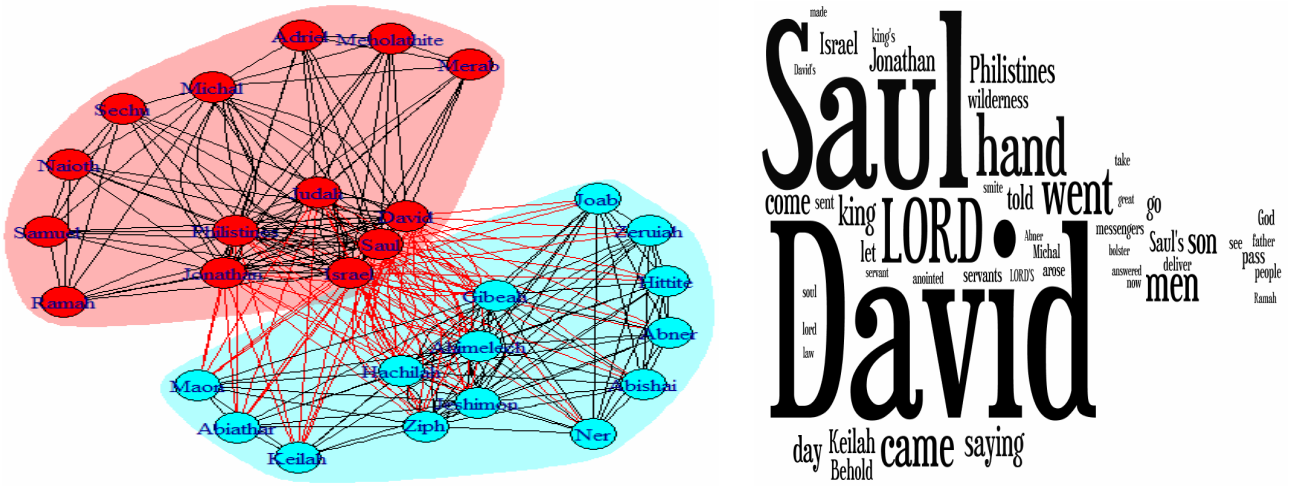

Figure 7.
Communities in the network of five chapters on Saul's Pursuit of David (left) and word clouds of top 50 most frequently occurred words in these chapters (right).

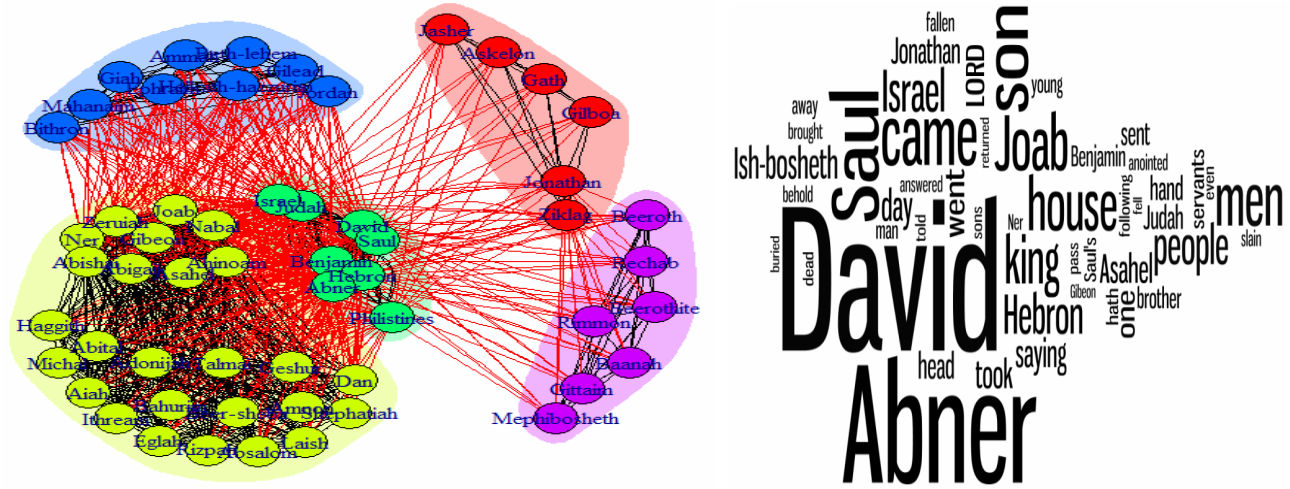

Figure 8.
Communities in the network of chapters 1-4 (left) and word clouds of top 50 most frequently occurred words in these chapters (right).

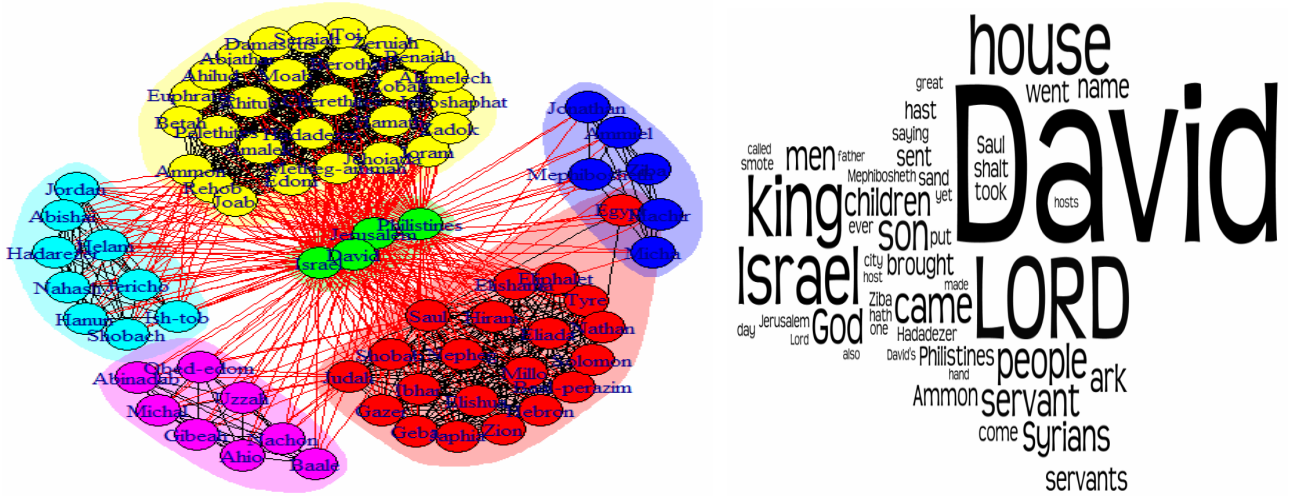

Figure 9.
Communities in the network of chapters 5-10 (left) and word clouds of top 50 most frequently occurred words in these chapters (right).

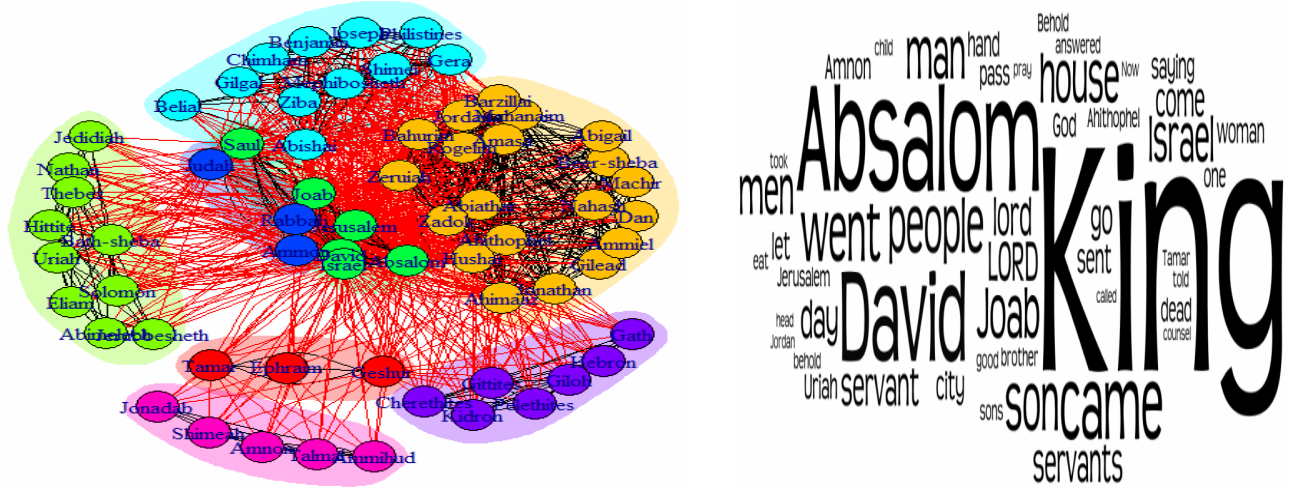

Figure 10.
Communities in the network of chapters 11-19 (left) and word clouds of top 50 most frequently occurred words in these chapters (right).

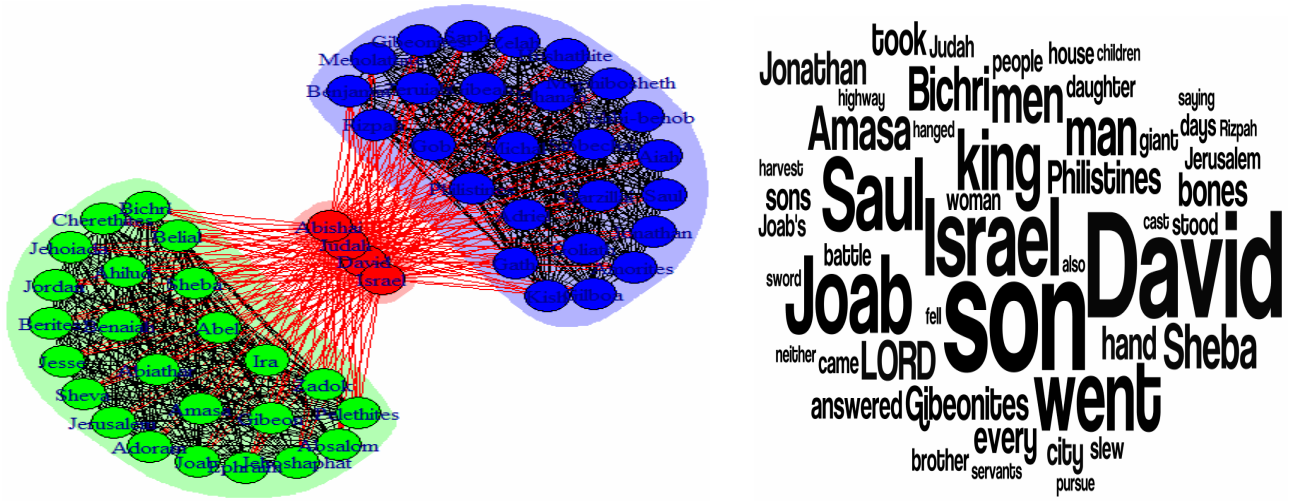

Figure 11.
Communities in the network of chapters 20-21 (left) and word clouds of top 50 most frequently occurred words in these chapters (right).

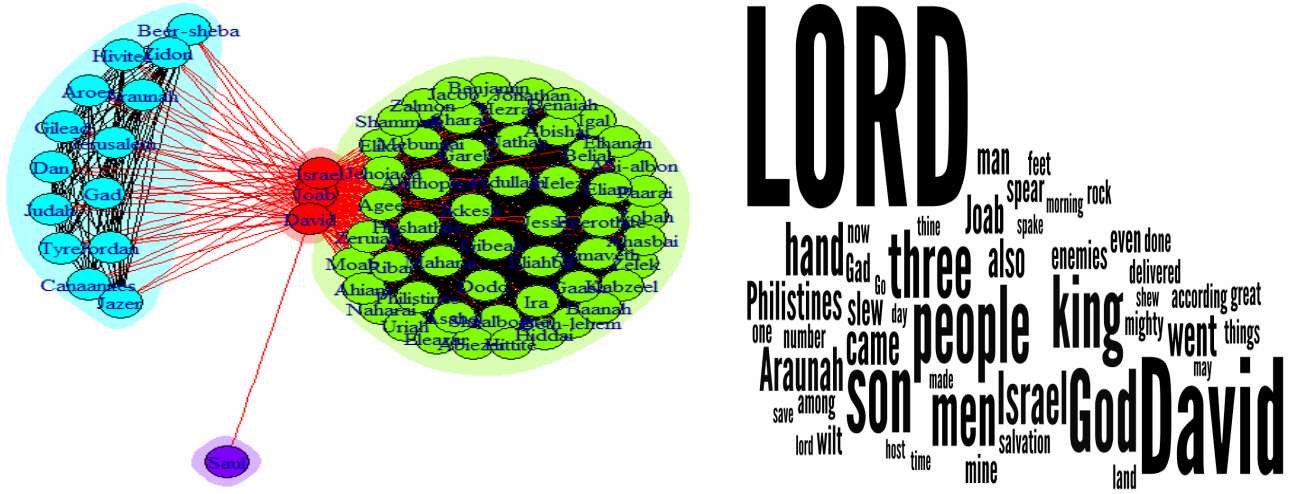

Figure 12.
Communities in the network of chapters 22-24 (left) and word clouds of top 50 most frequently occurred words in these chapters (right).

Communities in the Social Networks from First Samuel

Communities in the Social Network from Chapters 1-8

The main actor in these chapters is Samuel along with other key players such as Hannah, Eli and his two sons, Hophni and Phinehas, plus his grandson I-chabod, and Samuel's two sons Joel and Abijah. Born to Hannah and Elkanah, Samuel grew up in the temple at Shiloh, defeated Philistines at Mizpah, anointed Saul and then David, died and was buried at Ramah. The name Samuel meant "God has heard", as the child Samuel was given in answer to Hannah's prayer. These chapters present the life of Samuel, decay of the priesthood as shown by Eli and his two sons, and the Ark of the Covenant taken by Philistines when they won the battle against Israelites. But the Ark caused a disaster in the land of the Philistines and out of fear they returned the Ark back to Israel. Finally Israel asked for a human king.

Hannah was one of the two wives of Elkanah, and the other was Peninnah, who bore children to Elkanah, but Hannah remained childless. One day Hannah and Elkhana went from their hometown Ramah to the temple at Shiloh, where Hannah prayed to God for a child while Eli was there. Eli was the high priest in Shiloh. God gave three sons and two daughters to Hannah including Samuel (1 Samuel, 2: 21). Samuel grew up in the presence of the Lord and established a school to train young prophets in Ramah. He also died and was buried there. He was the last of the judges, after whom Saul became king of Israel.

Eli's sons, Hophni and Phinehas, were wicked and the sons of Belial (meaning worthless) although served as priests, as they had no regard for the Lord. Eli was high priest and judge over Israel, but he did not take actions to correct them. One day a man of God came to Eli to inform him of God's judgment on his household: his descendents would die at an early age, Hophni and Phinehas would die on the same day, and another family of Aaron would be given the office of high priest. Hophni and Phinehas were slain in chapter 4. Phinehas's wife gave birth to a son I-chabod. As a judge, Samuele visited the area between Bethel, Gilgal, Mizpeh, and Ramah regularly. But his

sons Joel and Abiah who also served as judges at Beer-sheba, judged unfairly.

Encoded with so much information about the stories happened during this period, this network showed two prominent communities with different colors, with Samuel, Ramah, and Israel being at the center of the whole network (**Figure 4**). The vertices Eli and Philistines were at the center of their own community. Samuel was close to Ramah and Eli close to Shilon. Eli's two sons Hophni and Phinehas were close to their father and also to Belial (meaning worthless), and Samuel's two sons Joel and Abiah were close to Beer-sheba where they served as priests. Vertex Philistines was connected to their three major cities, Ashdod, Askelon, and Gaza, where the temple of Dagon was located. Philistines captured the Ark after defeating the Israelites in a battle at a location between Eben-ezer where the Israelites encamped and Aphek where the Philistines encamped. In **Figure 4**, Israel and Eben-ezer were in one community colored light blue, and Philistines and Aphek were in the other community colored red.

Communities in the Social Network from Chapters 9-15

The main figures in these chapters are Samuel and Saul with a focus on the rise of King Saul. Saul was anointed king by Samuel and presented to Israel, rescued Jabesh-Gilead and was acclaimed king by Israel. These chapters describe Saul's victory over the Ammonites, Samuel's farewell speech to Israel, Saul's first failure to offer burnt offering by himself instead of by Samuel as priest, Jonathan's victory and Saul's second failure to follow the Lord's command to totally destroy Amalekites and their properties, and God's final rejection of Saul due to his disobedience. The events in Chapter 15 marked a turning point in Saul's life, since God instructed Samuel to anoint David as the next king of Israel in chapter 16. Samuel did not see Saul again until he died and he told Saul that "to obey is better than sacrifice" (1 Samuel, 22), a verse still having great value in our life today.

Saul's father Kish was close to him in the network (**Figure 5**). Kish was son of Abiel, the son of Zeror, the son of Becorath, the son of Aphiah. The commander of Saul's army was Abner son of Ner, Saul's uncle. Saul reigned from Gibeah, his hometown. The vertex Gibeah was next to Saul in the network, showing its close relationship to Saul. His family members were in the same community colored light green. In his farewell speech, Samuel reminded Israel of God's protection to them using Moses and Aaron as their heroes. Moses and Aaron were in one small community colored blue. Saul did not obey God's instructions from Samuel by making a burnt offering by himself at Gilgal and not destroying Amalekites and their properties. Samuel, Saul, and Gilgal were in the same group, but Amalekites was close the Saul but in another group.

Eli and Shiloh were at the boundary of the community colored light green and Ramah of Samuel was at the boundary of the community colored red, reflecting their reduced importance at this time.

Communities in the Social Network from Chapters 16-31

These chapters document the decline of Saul and the rise of David through the interplay between Saul and David, one as the current king and one as the successor to Saul and the next king. The stories presented in these chapters picture a clear contrast between Saul as a king after the people's own heart and David as a king after God's own heart. They record David as an anointed king to replace Saul by God's selection, David's famous victory over Goliath, Saul's growing jealousy and quest to destroy David. Other topics included David fled from Saul, friendship of David and Jonathan, the defense of David by Jonathan and Michal, David fled to the priest at Nob, to the king of Gath, and to the cave at Adullam, Saul's revenge on the priests of Nob for having helped David, David's exile at Kehilah and in the wilderness of Ziph, David spared Saul's life in the Wilderness of Engedi, Nabal and Abigail, David spared Saul for second time, David fled to Achish, king of the Philistines, Saul went to the witch at Endor, Achish sent David back to Ziklag, David destroyed Amalekites, the death of Saul and his three sons including Jonathan.

The song of the Israelite women, "Saul has slain his thousands, and David his ten thousands" (1 Samuel, 18: 7), made Saul very jealous of David, revealing Saul's focus on earthly reputation. Instead, David placed a higher value on unseen over the seen. The flight of David against Goliath revealed their difference in character, since Saul was tall and David was just a boy at that time. David refused the physical protection of the king Saul's armor in favor of prayer and demonstrated his courage, wisdom, and faith, proving that he was the ideal man for the throne of Israel. Many of the older sons of Jesse were very impressive in their physical appearance, but God instructed Samuel to anoint the youngest son David, a shepherd boy, to be the next king after Saul.

It was a long journal for David from his anointing as a future king of Israel to eventually becoming king. During this whole period, David refused to take up the throne by forceful means but left it in the hands of God and waited for His timing. Saul pursued David into the desert where David spared his life twice, one in a cave and the other in Saul's tent while he was asleep. Still, Saul continued his pursuit. During this period, Jonathan developed a brother-like friendship with David. These chapters also record the weakness of David as he showed panics under the pressure of being pursued and lied to Ahimelech, the priest at Nob (1 Samuel, 21: 1-9), and to Achish the king of Gath (1 Samuel, 21: 10-15). These stories of Saul and David reinforced the supremacy of divine justice as articulated in Hannah's song: The proud will be humbled and the humble exalted.

Saul and his three sons, Jonathan, Abinadab, and Malchishua died on Mount Gilboa. Now Judah of David was at the center of the network, while Gibeah of Saul moved a little bit farther away from the center (**Figure 6**). Goliath, the champion of the Philistines, was in the red community and not very close to the vertex Philistines since this vertex is also strongly connected to other vertices. The couple, Nabal and Abigail, was in the same community colored light green and Zeruiah, David's sister, with her two sons, Joab and Abishai, were in the same community colored light blue. Samuel was in the center of the networks in **Figures 4** and **5**, but in this **Figure 6**, he was in a community colored yellow, not at the center anymore. David definitely entered the picture as a major character, along with another key player Jonathan, which was located in the center of this network. David and Jonathan were close to each other in the same group because of their friendship, and both of them were in the center. David was close to his father Jesse although they belonged to two different groups, and Jesse was connected to his other three sons, Abinadab, Eliab, and Shammah, and his hometown Bethlehem.

Saul's Pursuit of David

This story was the most interesting one in First Samuel, which displayed the opposite traits of Saul and David. Saul was trying to kill David, but David spared Saul's life not only once but twice. Each time after learning David had spared his life, Saul cried and promised David not to kill him anymore, but Saul continued his pursuit afterwards. We singled out the chapters that described the direct contact between Saul and David during this period and summarized each chapter below.

Chapter 18: All Israel and Judah loved David, so Saul became jealous of David. One day Saul hurled a spear towards David while he was playing the harp for Saul. But David eluded him twice. Saul promised to give his daughter Merab to David as his wife but Saul instead gave her to Adriel of Meholathite as wife. Saul's son Jonathan was very fond of David and protected David. David and his men went out and killed two hundred Philistines. Then Saul gave David his second daughter Michal as his wife.

Chapter 19: Saul tried to pin David to the wall with his spear as David was playing the harp, but David eluded him again. Saul then sent men to watch and kill David, and Michal helped David to flee. David went to Samuel at Ramah and then Saul went from a great well in Sechu to Naioth at Ramah to find David.

Chapter 23: The Ziphites went up to Saul at Gibeah and said, "Is not David hiding among us in the strongholds at Horesh, on the hill of Hachilah, south of Jeshimon?" So Saul pursued David from Keilah to the desert of Ziph and then to the wilderness of Maon. When a messenger came to Saul, saying the Philistines are raiding the land. Then Saul broke off his pursuit of David and went to fight the Philistines. Abiathar the priest was with David during this time.

Chapter 24: David spared Saul's life in a cave at En Gedi.

Chapter 26: Abishai and Ahimelech went with David to the camp of Saul at night. Abner son of Ner was with Saul as his commander of the army. Saul made his camp beside the road on the hill of Hakilah facing Jeshimon. David asked Ahimelech the Hittite and Abishai son of Zeruiah, Joab's brother, to go to Saul's camp by night. When David and others went into Saul's camp, he was asleep. So David spared Saul's life again.

Because of the direct interactions between the people of Saul and those of David, there was no clear separation between the followers of Saul from the followers of David as illustrated by the two communities identified in this network (**Figure 7**). However, these two communities did show Saul and David as being the center of both of them.

Communities in the Social Networks from Second Samuel

Chapters 1-10 of Second Samuel detail the rise of David's kingdom. Because of the resolution limit of the community graphs, we divided these chapters into two parts, chapters 1-4 and 5-10.

Communities in the Social Network from Chapters 1-4

The last part of First Samuel marks the end of Saul's life and Second Samuel opens with more details to the death of Saul. We have to remember that Saul had hunted David for many years prior to Saul's death. Chapters 1-4 record David's lament over Saul and Jonathan who died on the battlefield of Mount Gilboa, David was anointed in Hebron as king over Judah his own tribe, Saul still had one surviving son Ish-bosheth who was crowned king over Israel, the war between the houses of David and Saul, David had six sons born in Hebron: Amnon, Kileab, Absalom, Adonijah, Shephatiah, Ithream, David asked Abner and Ish-bosheth to return his wife Michal, Joab had two brothers, Abishai and Asahel, Asahel was killed by Abner who was cousin to Saul and the commander-in-chief of Saul's army and went over to David, Joab murdered Abner for revenge, and finally Ish-bosheth was killed and the northern tribes asked David to rule the entire nation of Israel.

David, Israel, and Saul remained at the center of the network, and Saul was next to Benjamin, his tribe. Zeruiah, sister of King David, had three sons, Joab, Abishai and Asahel. David had six sons born in Hebron. All these family members of David were in the same group colored yellow. Jonathan was next to Gilboa where he and his father died. Abner was a prominent figure in these chapters as his name appeared 46 times and many David's activities occurred in Hebron while he was king over Judah, which explained the centrality of these vertices in the network (**Figure 8**).

Communities in the Social Network from Chapters 5-10

Chapters 5-10 include David united the kingdom and became king over Israel, David brought the Ark to Jerusalem, God's promise to David, David's victories over the enemies including Moab, Philistia, Zobah, and Syria, David's kindness to Mephibosheth son of Jonathan since David made a covenant with Jonathan, and David defeated the Ammonites and Syrians. David took Israel into several battles to win some of the promised land that had never been fully claimed.

The Davidic covenant recorded in chapter 7 is the theological centerpiece of this book. God made the house of David to prosper and in light of this the desire to build a permanent dwelling place for God arose in David. So he wanted to build a temple for worshiping God. Through the prophet Nathan, God informed David that He would not allow David to do so but his son Solomon would. Further God promised David that He would establish a house for David and the house and kingdom of David would endure forever before God and his throne would be established forever. God promised David that the Messiah, Jesus Christ, would come from the lineage of David and the tribe of Judah and would establish an everlasting kingdom. This promise to David was in fact the further unfolding of a previous promise God gave to Abraham in (Genesis, 15: 18). It also fulfills Jacob's promise that the scepter will never depart from Judah, David's tribe (Genesis, 49: 10).

One noticed that Saul moved from the center to a community colored red and Jerusalem became the center of this network, signaling the beginning of David's kingdom. In Hebron David reigned over Judah for seven years and six months and in Jerusalem he reigned thirty and three years over all Israel, as a result Jerusalem was at the center of this network. Judah and Hebron were in the same group colored red. Mephibosheth was next to his father Jonathan, and David showed graciousness to him due to the covenant between David and Jonathan (**Figure 9**).

Communities in the Social Network from Chapters 11-19

Chapters 11-21 cover David's sins and their consequences. For the sake of clear visual presentation, we divided these chapters into two groups, chapters 11-19 and 20-12. Chapter

11-19 describe David's adultery and murder, God's punishment on David, birth of Solomon, defeat of Ammon, rape of Tamar by Amnon, death of Amnon, and rebellion as well as death of Absalom.

David committed adultery with a married woman, Bathsheba, and got her pregnant. He then attempted a cover-up. When that failed, he conspired having her husband Uirah killed. Although David repented when the prophet Nathan confronted him regarding his sins and God forgave him, He promised David the judgment: "Now the sword shall never depart from your house" (2 Samuel, 12: 10).

The consequences of David's sins affected not only himself but also his family and his nation. Up to this point, three of David's son had died, Amnon, Absalom, and the first child born to David and Bathsheba. After the death of his elder brothers Amnon and Absalom, Adonijah, the fourth son of David, considered himself to be the rightful heir to the throne and proclaimed to be king when his father was dying. He was put to death after Solomon became king of Israel as successor of David (1 Kings, 2: 13-25). Amnon Absalom, and Adonijah died not only as punishments to David, but also because of their own sins. Absalom was prominently featured in these chapters. Completely different from Solomon, Absalom committed many heinous crimes such as sleeping with his father's concubines, plotting a conspiracy to kill his father.

Absalom was a new key player in this time, since he killed Amnon who rapped Tamar, rebelled against his father, and was killed by David's general Joab in the forest of Ephraim. After Absalom had killed Amnon, he fled to Talmai, the son of Ammihud, king of Geshur, since Absalom's mother was princess of Geshur. Ahithophel was a wise counselor of David, but during Absalom's rebellion against David, he betrayed David and became an adviser to Absalom. These names were next to each other in the network. The chief figures in David's adultery, Bathsheba daughter of Eliam, Uriah of Hittite, and Nathan, were in one community along with Solomon who had another name Jedidiah given by God through Nathan.

Communities in the Social Network from Chapters 20-21

Chapters 20-21 present the rebellion of Sheba son of Bicri, a Benjamite, three years of famine because Saul and his house put the Gibeonites to death, the revenge of Gibeonites, and the defeat of Philistines. In Canaan the Philistines were strong, having battles against Israel throughout the period of the judges. However, the leadership of Samuel, Saul and then David eventually made the Philistine threat declined.

Israel, Abishai, Daivd, and Judah were mentioned in both chapters, which explained why they were at the center of this network. Saul is at the boundary of the community colored blue (**Figure 11**).

Communities in the Social Network from Chapters 22-24

Chapters 22-24 conclude this book with final reflections on the life of David, showing the closing phase of David's reign, his faith through his psalm of praise to God, his thanksgiving in his last words, the names of his mighty men including Uriah of Hittite, and his sin of numbering people and the resultant plague as God's punishment, his construction of an altar.

Araunah, appeared in the blue community (**Figure 12**), was a Jebusite whose threshing-floor in Jerusalem was pointed out to David by the prophet Gad as an ideal site for building an altar of burnt offering to God. The destroying angel, sent to punish David for his sin in taking a census of his people, was withheld from his destruction near that threshing-floor. Araunah offered it to David as a free gift, but David insisted on purchasing it at its full price (2 Samuel, 24: 24), for he could not offer to God what cost him nothing. On the same location Solomon afterwards built the temple. Joab, a central figure in this network, was killed by Solomon according to David's command (I Kings, 2: 5-6). The end of this book seemed sad for Saul as he became a single outlier in this network, but David remained in the center of the network (**Figure 12**).

Discussion and Conclusion

Israel started as a nation of loosely organized tribes led by priests and heroes. The books of Samuel document Israel's transition from a group of 12 tribes ruled by judges, represented by the last two judges Eli and Samuel, to a united state ruled by kings, represented by the first two kings Saul and David. Through three central figures, Samuel, Saul, and David, two obeyed and one disobeyed, they demonstrate that God reigns by adapting to human situations to accomplish His plans and purposes, regardless of their response to Him. The history of Israel proves that trusting in God would lead to victory over their enemies whereas relying on their own strength would result in failure and defeat. It is interesting to notice that Saul, David, and Solomon all served as king of Israel for 40 years.

The service of Samuel brought to an end of judges and gave hope in a humanly desirable king. Saul, a man according to human flesh, was more concerned with earthly objectives than with spiritual matters of God. On the other hand, the kingship of David, a man according to the heart of God, demonstrated the characteristics of an ideal ruler relying on God in every situation, and brought hope in the coming Messiah. The books of Samuel document many positive achievements of David as well as his transgressions and punishments, which show that God remained loyal to His promise although David at times failed the covenant. God gave David and Bathsheba the child Solomon, whom later became king of Israel. He was merciful by safeguarding David during the rebellions of Absalom and Sheba. On the other hand, David confessed his sins before God, unlike Saul who always tried to excuse his sins, which made all the difference in their life, revealing that God hates and punishes sins but loves sinners. Hannah described God in (1 Samuel, 2: 3-10) as: He brings low the boastful, arrogant, mighty, full, rich, and wicked, and in contrast He exalts the feeble, hungry, barren, poor, low, needy and godly.

Through the communities found in a sequence of social networks from the books of Samuel, we could learn the roles played by key figures such as Eli, Samuel, Saul, David and their interactions with others during each important period. The community structures discovered from this sequence of networks visualized the interesting stories occurred during this critical transition of Israel from rule by judges to rule by kings.

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Les Châteaux de Landiras et de Montferrand and Their Seigneurial Families

—Part One: Setting, Medieval History, and Genealogy

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Apart from Arnaud Communay's "Genealogical Essay", as he himself noted (1889: v), the Montferrands of the Bordeaux region have been neglected.[1] The present approach to their history initiated in research on the Château de Landiras, whose baronial family tended to heiresses until one of them married a Montferrand. So began a four-century association of the "first and second baronies of Guyenne"! This first part will describe the socio-geographical settings of the two branches, some of their medieval experiences, and then proceed to presenting the combined genealogies—a task not previously attempted. The second part will narrate their respective and blended subsequent histories.

Keywords: Montferrand de Guyenne; Landiras; Saint Jeanne de Lestonnac; Bordeaux; Hundred Years' War; French Revolution; Bertrand III; Pierre II; Lesparre; de Goth; de la Roque-Budos; Communay; Graves Wine

Geographical Setting

About thirty-five kilometres southeast of Bordeaux, one finds the name Landiras attached to a small stream, a village and *commune*, and a château. The town's medieval significance is indicated by its holding perhaps as many as four fairs each year (on 2 or 3 February, 11 November, the second feast of Easter, and the second feast of Pentecost), as well as a market every Sunday (Baurein. 1876: III, 206; Féret, 1874: II, 446). Yet in modern times, the city has only grown from 1535 in 1726 to 2061 residents in 2009 (Baurein, III, 205; Wikepedia; cf. Baurein: II, 205). The town's patron saint was St. Martin, whose feast day is the same 11 November as the town's fourth annual fair; the local 12th-century church bears his name (Féret, II, 446).[2]

Almost three kilometres to the west of the town, one finds an imposing château, beside the ruins of a 14th-century castle, the principal site of the renowned *seigneurie* of Landiras. The original grand edifice was a 12th-century square fortress, with towers at each corner and its main door protected by two other polygon towers, surrounded by a moat. Eventually demolished, only a few ruins, one tower or citadel, and part of the moat remain (Jouannet, 1837: I, 275; cited in Communay: lxxiv, n. 8). Today's château was built in the early 19th century beside the original site.

For their part, the Montferrand family possessed from early times a strategically important site, dominating the mouths of the Garonne and Dordogne Rivers and so the port city of Bordeaux.[3] The barony extended into the parishes of Ivrac, Bassens, Sainte-Eulalie, Saint-Pierre de Quinsac, Montferrand, Ambarès, and La Grave-d'Ambarès (Communay, xliv, n. 4; cf. Grasset, 50). Across from Bordeaux and a little downstream, the *château fort* ("castle") of Saint-Louis-de-Montferrand, in the parish of Saint-Pierre de Bassens, presided over its territory like a "veritable sentinel".[4] Indeed, the Kings of England often appointed a Montferrand (from one branch or the other) as *sénéchal* (*grand-bailli*)[5] of Bordeaux. Only in 1591 was the city able to purchase the specific property and have the château destroyed.

[1]Though presenting several Montferrand families throughout France, F-A de La Chenaye Des Bois ignored the one in Guyenne in his multivolume grand Dictionary of French nobility (1770-1778).

The name "Montferrand" refers both to towns and to various, quite different families. Speaking at least of the Bordelaise extended family, one source insists that "Monferrant" is the modern spelling, the "-d" ending being found occasionally "in the old titles" (Féret 1889: III, 469). Not all modern scholars respect this opinion.

[2]This is Saint Martin of Tours (ca. 315-8 November 397).

[3]There's an historical conundrum here, however, for it would be just as likely that the Montferrand castle had served, and been seen as serving, to protect Bordeaux as much as to threaten it. What's the story?

[4]Grasset, Jean, Pastureau, 1981 (hereafter: Grasset). I can't find these striking words in the text, but they are in the virtual poster advertisement for the book on the Internet. Grasset certainly reiterates the point in diverse words (49, 94 & 109).

[5]It's not clear why several of my sources redundantly state someone was a *balli/sénéchal*! Either term refers to an agent of the king or of a lord governing a jurisdiction termed a *baillage* or a *sénéchaussée*, respectively, the former usually found in northern France and the latter generally in the south ("*Grand*" was merely a way of distinguishing a royal agent from others). This delegated authority covered administrative, military and even judicial functions.

Earliest References

The name "Landiras" (formerly, also spelt "Landirans", or "Landirats" in Gascon) is found in the archives as early as the late 12th century. The "*-as*" termination of words in the Gascon language "suggests some sort of grandeur, as disagreeable as excessive" (Baurein: III, 204).[6] Rostand, *seigneur* de Landiras, sold a fourth part of the *dîme* of Barsac in 1173 to Guillaume Le Templier, archbishop of Bordeaux, who made a gift of the *dîme* to his cathedral (Baurein: III, 161 & 207; and Lopes, 1884: 216). A Rostand de Landiras again appears in a 1236 charter. More than a half century later, we find another Rostand de Landiras and his sister, Isabelle de Landiras (1230/35-ca. 1279),[7] wife of Gaillard de La Mothe (1230-1279), who probably had a sister, Clairemonde de La Mothe. These four appear to have left an orphan niece/daughter, Clairemonde (or Esclaremonde) de La Mothe-Landiras (ca. 1260-1301 or '28). The seneschal Jean de Grailly, from Gex, near Geneva,[8] may have married "aunt" Clairemonde de La Mothe (Bailey, 2006: 30-32)[9] and arranged to have his nephew, Jean Roussel de Saint-Symphorien, also originally a Savoyard, marry her niece, the wealthy heiress of Landiras.[10] This Jean Roussel appeared in a document of the year 1290, issued by Edward I of England (1272-1307), which empowered him to look after his uncle's estate while the latter was in the Holy Land.[11]

Landiras's medieval reputation was as "the second barony in Guyenne", with the Montferrand barony reputed as "the first". But it was not always so: Landiras appears to have had no natural advantages for becoming a significant medieval barony. Earlier, Lesparre—one of the largest and oldest baronies in the Bordelaise (Baurein: I, 142)—was seen as the region's "second barony". Yet as Lesparre came into and then passed out of the possession of the barons of Landiras, their respective influence was exchanged. And so it was with the originally powerful barony of Blanquefort, whose brief association with the Montferrand family seems to have coincided with a transfer of preëminence from the former to the latter. Apart from strategic marriages and capricious genetics, I am not sure how the barony of Landiras attained such prominence. The same factors no doubt aided the Barès family, who morphed into the Montferrand. But in their case, their principal *château fort*, Saint-Louis-de-Montferrand, dominated the Bordelaise and so gave natural advantages for its prominence. Even the powerful Dukes of Aquitaine were never able to bring the barons of Montferrand under their sway.

Both lordships included many and diverse *seignieuries*, *baronnies*, and even a *vicomté* or two, and we have tried to respect these distinctions throughout. Some transfers of title or *terre* were not truly natural, since the Kings of England sometimes arbitrarily transferred titles, suspiciously without reason (Baurein: II, 94; cf., *idem*. III, 273). In addition, as the Kings of France struggled to gain control over territories theoretically under their suzerainty, they made other transfers as rewards for fidelity or punishments for disloyalties. Thus, for example, the barony of Lesparre was taken from Pierre II de Montferrand-Landiras in 1541, but descendents pretended to the title for several generations (Baurein: I, 159/160).

Attaining Medieval Prominence

The barony of Landiras attained prominence when, as we have seen, Jean Roussel de Saint-Symphorien married its heiress, Clairemonde de La Mothe-Landiras, around 1290. For his uncle, Jean de Grailly, had won such favour with King Edward I of England that he was made *sénéchal* of Bordeaux. Jean de Grailly had even twice served as a crusader in the Holy Land. Just over sixty years later, John de Stratton (another non-Bordelaise) married a later heiress of Landiras, Isabeau de Saint-Symphorien, and soon brought further importance to the barony. Their daughter's marriage to Arnaud de Preissac brought Landiras into association with the barony of Lesparre, as well as several other important lordships, and made it the second barony in Guyenne—with the baron's right to hold the bridle of the Archbishop's horse in processions (Grasset: 50). Soon after her marriage, this Marguerite de Stratton inherited the seigniory of Uzeste from the last male of the de Goth family. Then, in 1410, a third heiress in three generations brought the Landiras and Montferrand dynasties together.

A few words more concerning John of Stratton, who arrived in Guyenne in 1355. In 1377, he was defeated in a battle against Charles V's Constable Bertrand du Guesclin on the Lacapere plateau, with the result that the château de Landiras temporarily passed under French suzerainty.[12] In 1379, the Stratton couple received (as compensation?) from King Richard II (1377-1399) the goods, situated in the Bazadais, seized from the rebel Gaillard de Goth, seigneur de Roaillac, a descendant of our Indie de Goth's uncle (Anselme, 1967: II, 173, 176 & 183)[13]—see next paragraph. Among other offices and remunerations, Richard II made Jean de Stratton *châtelain et connétable* (castellan and constable) of the château of Bordeaux on 26 August 1382 (Baurein: IV, 289). His widow was confirmed in these privi-

[6]Many details concerning Landiras and its region may be found in "Saint-Martin de Landiras," article XXXII, in Baurein *Variétés bordeloises*, vol. III, 204-08. (All translations from the French are by the author.)

[7]Dates presented like this "(1230/35-ca. 1279)" indicate the range of disagreement concerning a birth, a marriage, or a death.

[8]Jean III de Grailly (1220/30-1303) descended from a noble Savoyard lineage, but he became a servant of the King of England on the other side of France, serving him both in the Bordeaux region, eventually as seneschal de Bordeaux, and twice in the Holy Land. His career and his marriages clearly established his (and his nephew's) family in Guyenne, and justified a changed nomenclature: "Jean I"!

[9]The marriage of the seneschal Jean de Grailly is both important and obscure—important because he was an ancestor of Henri de Bourbon-Albret-Foix de Navarre, who became Henry IV of France, and obscure because many sources identify no known spouse. (See Casanovas, 1991: 140, n. 832). Many have him marry Clairemonde de La Mothe-Landiras (for details of these sources see Bailey, 2006: 30-32), but supposed descendents of this match soon peter out. Curiosity aroused, I thought the mystery could be solved by seizing on a one-source mention of a same-name aunt for Clairemonde; this resolution was problematical but it responded to diverse claims that uncle and nephew had married the same person (*loc. cit.*). "Ahnentafel" concurs with four of the standard sources (#7104).

[10]Jean Roussel (b. ca. 1250) was the son of Guillaume Roussel de Saint-Symphorien (b. ca. 1220) and Guillermine (or Guillemette) de Grailly (b. ca 1225, daughter of Pierre de Grailly and sister of the seneschal of Guyenne). An Internet source for this information gives his wife's name as Esclarmonde de La Mothe (1260-af. 1328); this source does not know the name of Clairemonde's mother, another knows the mother only as Isabelle, while a similar source knows the names of neither of her parents.

[11]For more details, see "Branches collatérales des Montferrands," 1. The next few paragraphs owe much to this source.

[12]This must have been a part of the Battle of Eymet, in which Bertrand II de Montferrand also fought.

[13]This would be Gaillard I de Goth. Ansleme (1987: II, 176) describes Gaillard I's ambiguous relations with the English and French kings and penalties incurred around 1345, but then has Gaillard die before November 1371, that is, before the confiscation mentioned above. In fact, though, Gaillard died after 1380 ("Family de Goth").

leges in 1408. It may have been Jean de Stratton who built the dominating château de Landiras in 1377.[14]

For their part, the 1303 marriage of Armaudin III de Barès's to Indie de Goth significantly aided the Montferrand ascendency by virtue of Indie's uncle. Bertrand de Goth, Archbishop of Bordeaux (from 1297), was soon to be elected Pope Clement V (1305-14). The *château fort* de Monferran [*sic*] was magnificently rebuilt (Communay: 1).[15] Their son Bertrand I married Régine de Durfort, the daughter of the *seigneur* de Blanquefort,[16] then the first baron of Guyenne, and of Marqueze/ Marquesse/Marquise de Goth (Bertrand's mother's niece). And *their* son Bertrand II felt justified in changing the family name from Barès to Montferrand. Grandson Bertrand III (1380-1435/46) was among the several in the family to be made *chevalier de l'ordre de la Jarretière* (knight of the [English] Order of the Garter). Already baron and lord of Montferrand and several other places, including Pondesac (which today gives its name to the *canton* in which the *commune* of Landiras is found),[17] he became *châtellain* of the strategic *château fort* de Blaye-et-Sainte-Luce and seneschal of Bordeaux (*sénéchal* or *grand bailli de Guyenne*). The "most illustrious of the Montferrands" (Grasset: 97), he was "the first baron in Guyenne" and a favourite of the English king.

In 1401, Bertrand III married Marguerite d'Astarac, who bore him one or two sons, Jean I de Montferrand (bf. 1404-1442) becoming the heir of his father's Montferrand lands. It was through Bertrand's second marriage, in 1410, to the rich heiress Na Isabeau de Preissac, that the titles and lands attached to Landiras entered the family. *Dame* de La Trau, de Landiras, etc., she was the only child of Bernard Arnaud de Preissac, who was also, like the Baron de Montferrand, a knight ("*chevalier*") and "one of the most valiant warriors of his century" ("Montferrand", 7). Landiras was by now the "second barony" of Guyenne, and the Baron of Preissac was himself seneschal of Marennes and governor of Mortagne. This marriage therefore brought together the two most prominent families of Guyenne.

One might see such a "skillful matrimonial policy" being extended (reversed?), when, for example, the heiress Isabelle de Montferrand brought the viscounties of Uza & Aureilhan and other possessions into her 1572 marriage to Pierre II de Lur, so constituting "the original nucleus of [this] family's patrimony" (Figéac, 1996: I, 244).

Once attaining prominence, the Montferrands had created heraldic arms, a new device which entered general use in the early 13th century. An English lay description of their arms would be: "Alternating lines of gold and red, edged by a black border dotted with bezants".[18] The marriage of Bertrand III de Montferrand and Na Isabeau de Preissac-Landiras meant a reconfiguring of the coats of arms of both families. The joint arms may be found in a 17th-century rendering in the choir of the church of Saint-Michel-de-Rieufreyt, a town a little to the north of Landiras earlier given into Gaillard de Landiras's jurisdiction.[19] In the upper left and lower right corners are reproduced the vertical gold and red lines surrounded by a black border with bezants that we have just encountered as the Montferrand arms. In the upper right and lower left corners are those of Landiras: on a silver (code for "white") background is placed a red cross, on which sit five gold ("yellow") stars, one in the centre and one on each arm of the cross. Superimposed in the centre of the coat of arms, where the four crests meet, is the Preissac symbol: a tongued, clawed lion with paws in the air.[20]

The Hundred Years' War (1337-1454)

At the time of the coming together of the Montferrand and Landiras families, France and England were more than halfway through the Hundred Years' War. Officially initiated in 1337 by Edward III's claim to the throne of France and by troublesome French aid to the Scots, then sustained also by commercial ambitions, the underlying reasons were also concerned with the English kings' desire for more independence in their position as French vassals. Not only had Normandy been lost to France less than a hundred and fifty years earlier (and it was to be the site of many battles and the temporary re-establishment of Eng-

[14]The 2009 labels on bottles of the château's wine state a château was erected in 1306, a date rather early for it to have been built by Jean de Stratton, as suggested by Marc-Henry Le May (1995: 765). When was the castle built whose ruins one sees today? (Le May's recent edition of *Bordeaux… et ses vins* has the fullest discussion of the history of the Château de Landiras of the entire series launched in 1850 by Charles Cocks. But the series's area of expertise lies elsewhere and perhaps cannot be relied upon for the accuracy of every detail. Still it's all we have on this rather central matter!)

[15]That is, the first page of the documentation ("pièces justificatives"). The introduction (pp. xii-xix), together with its Genealogical Table, is a principal source for information throughout this article.

[16]Edward II had given Blanquefort to Bertrand de Goth in 1308 and it soon passed into the Durfort family (Courcelles, 1824: IV, "de Blanchefort [sic]", 5, note [in Courcelles, pagination starts over with each family]). (What does "give" mean here, since the de Goth and Blanquefort families had intermarried the century before? Sometime before 1289, Régine de Goth la jeune [she had an elder sister with the same name] married Bernard de Durfort, sgr de Flamarens [d. bf. 1329]). Courcelles, 1826: VI "de Goth ou de Gout", 17. Indie de Goth was a sister born just before the second Régine. Alternatively, Régine was an elder sister, the younger being named "Reine", and it was the elder who married Bernard de Durfort ("Famille de Goth/Gotz/ Gout"). For more about Indie de Goth, see note 29 below.

In 1338, Edward III transferred the seigneurie de Blanquefort to Gaillard Roussel de Saint-Symphorien, sgr de Landiras, after Gaillard de Durfort's "treason". When Gaillard de Durfort et de Duras reattached himself to Edward III, however, the seigniory of Blanquefort was returned to him (Baurein: II, 169). Durfort was made governor of Calais; he died at Poitiers.

[17]He was also Baron de Langoiran, sieur de Rions and seigneur de Veyrines, Agassac, and Soussans, for example. "Baron is a title given by the king to his most faithful servants" ("Les Seigneurs de Landiras_2").

These possessions indicate an important Montferrand presence in the Landiras region before the intermarriage of the two.

[18]Described as "Palé d'or et de gueules, à la bordure de sable, chargée de besans d'argent," these arms are in another version stated to have precisely *eight* bezants. Decoding this description, we note the word for wooden stakes ("pal"), here used as a verb ("palé") to mean dividing what become lines into pairs; gules ("gueules"), from gule (gullet), a heraldic term for red educed from the term for an ermine-died collar; the sable, a dark-brown small carnivorous animal, which lent its name to the colour black; and bezants, originally Byzantine gold coins, minted in Europe also in silver, and represented in heraldry simply as small disks. (When not referring to something like coins, the word gold was often simply heraldic code for "yellow", so the lines above might better be described as alternating "yellow and red".)

[19]As early as 1307, Jean Roussel de Saint-Simphorin [*sic*] was described as "Seigneur Haut-Justicier de la Paroisse" (Lord High-Justice of the Parish) of Saint-Michel de Riufreyt [*sic*], but it appears that the actual exercise of this office had to be demanded and received by son Gaillard de Saint-Simphorin in 1340 (Baurein: III, 82/3).

[20]Professor Liliane Rodriguez, of the University of Winnipeg, was immensely helpful in interpreting the terms for the Preissac portion of this coat of arms.

A reproduction of these arms, on the left of a rectangle shared with those of Jeanne de Lestonnac, may be found at "Sainte-Jeanne de Lestonnac… JeanneEnfance". The quoted descriptions are from "Branches collatérales des Montferrands" under "SAINT-SYMPHORIEN," 1.

lish sway), but French pressure on English governance in Aquitaine was persistent and growing.[21] The Maisons de Montferrand and de Landiras were to be continually active throughout the War, and one lord or another often travelled to England to offer advice or raise troops.

Early in 1345, the year before the war's first great battle (at Crécy), our Bertrand I de Montferrand was among the many Aquitainian lords invited by Edward III to participate in a major joust at Windsor Castle. At this "gathering of the Knights of the Round Table", Edward learnt of a renewed threat to his French territories and so decided to send a large force, commanded by Henry, Earl of Derby, to engage the French in Guyenne. Following the ensuing battle at Bergerac, in August 1345, both Bertrand I de Montferrand and his brother Amanieu were knighted. Henceforth, male members of the family were entitled to call themselves "*chevaliers*". Son Bertrand II fought at both Poitiers (1356) and Eymet (1377).

Jean II Roussel de Saint-Symphorien-Landiras participated in that same meeting of the Knights of the Round Table in England as had Bertrand I de Montferrand. However, his own notable French campaigning was ten years later, with Edward the Black Prince (1330-1376), rather than in the expedition in which Montferrand was active. Indeed, Saint-Symphorien-Landiras fought beside the Prince of Wales in England's second great victory of the war, the battle of Poitiers (19 September 1356), in which the King of France, John II the Good (1350-1364), was taken prisoner. The baron of Landiras and Blanquefort accompanied the Black Prince and his royal captives to England. Jean Froissart (ca. 1337-after 1400), the famous French chronicler of the Hundred Years' War, eulogized the barons of Landiras in the following terms: "From this era and up to the conquest of Guyenne, we see the lords of Landiras marching at the head of the Bordelaise nobility and taking part in the most important affairs" (cited in "Branches… des Montferrand": 2).[22]

Throughout the first half of the Hundred Years' War, the papacy found itself mired in its own struggles, and here too, the Montferrands were twice peripherally involved. In wars of an earlier generation, the kings of both France and England had sought to tax the wealthy bishoprics and monasteries within their respective jurisdictions. In this effort they were vigorously opposed by the papacy. The culmination of the dispute was the rough handling of Boniface VIII by agents of King Philip IV and the Pope's premature death. The succeeding pope was the Frenchman Clement V, who moved the papacy and its bureaucracy to Avignon, in the French-dominated Rhone Valley. We have seen that it was Clement's niece, Indie de Goth, who had married Armaudin III de Barès, baron of Montferrand. Now, in the second half of the Hundred Years' War, the difficulties following efforts to return the papacy to the city of Rome had led to schism in the Church, with the election of two rival popes after 1378 and then three competing popes after 1409. Towards the end of this crisis, the Roman pope was Gregory XII (1406-1415), favoured by the English, most German states and others, and the Avignonese pope was Benedict XIII (1394-1423), whose papal decisions tended to reflect French interests.

The putative and the actual Montferrand archbishops of Bordeaux (sons of Bertrand II de Montferrand), Jean de Montferrand (1409-1410) and David de Montferrand (1413-1430), made their allegiance to the Roman pope, Gregory XII, which reflected the influence of and their support for the English side in the war.[23] Archbishop David was present at the meeting on 4 May 1415, held in the Chapter of Saint-Seurin (the meeting room in an ancient basilica in Bordeaux), which attempted, before the decisive English victory at Agincourt in October, to negotiate an Anglo-French truce, scheduled to be signed by the end of the year (Baurein: IV, 290). After this victory, Henry V (1413-1422) married the French princess Catherine of Valois and also added Normandy and other parts of northwestern France to his domains on the Continent. As it happened, his brother's illegitimate daughter, Mary of Bedford,[24] was in 1435 to marry into the newly established Landiras branch of the Montferrand family. Her husband,[25] eventually executed in Poitiers, pursued perhaps the most dramatic career of all the late-medieval Montferrands.

The story now passes to the second article, while we pause to

[21]Historians won't need to be reminded of England's long and complex role in governing extensive parts of France: 1) Long after their 1066 conquest of England, the Dukes of Normandy continued to defend their rights in France, significantly augmented by Geoffrey of Anjou's marriage to Margaret of England—until John lost the last of these territories to Philippe Augustus in 1214. The victories at Crécy, Poitiers and Agincourt effectively re-established this suzerainty. 2) Two years after his marriage to Eleanor (or Aliénor) of Aquitaine (ca. 1122-1204), Henri d'Anjou had become Henry II of England (1154-1189). Essentially the southwest quadrant of France, Eleanor's Guyenne was to spend the next three centuries closely tied to and often dominated by its English overlords—a phenomenon ended only in 1453.

[22]The Internet source cited writes that this assessment was recounted by [Léo] Drouyn [1816-1896]. (The conquest mentioned here was the one by the English in 1373. The "final" reconquest, in 1450-1453, by the French, was of course after Froissart's death.)

[23]David de Montferrand became bishop of Dax in 1408 and archbishop of Bordeaux after 17 May 1413. Despite ill health, he was called to London to advise on French affairs, but died there on 31 May 1429 (Mas-Latrie, 1889, 1397; and Fisquet, 1864: 332-33). Alternatively: bishop of Dax in 1406 and died in 1430 (Communay: Genealogical table & xx); archbishop of Bordeaux in 1414 (Féret, 1889: III, 468).

Elder brother Jean de Montferrand cannot accurately be listed as archbishop of Bordeaux (despite Communay: *loc. cit.*). As part of the dis- putes among rival popes and bellicose kings, Jean was named archbishop by a bull of Gregory XII, dated 12 December 1409, but 1) was opposed by the incumbent, Cardinal François II Hugocinio (or Hugocio or Hugotion; Francesco Uguccione, abp. 1384-1412), who had assisted in the attempt to dethrone Gregory at the Council of Pisa in 1409, and 2) was also opposed by the cathedral chapter and "tous les ordres de la ville"; Jean died in the midst of this dispute and the Cardinal continued in office (Grasset: 51; Communay xx). Alternatively, François II became archbishop of Bordeaux only in 1389 (Fisquet: 229-32). Another story makes no mention of "David", but erroneously assigns all his offices to Jean de Montferrand (Grasset: 51).

[24]This "girl bastard of Lancaster", born of an unknown woman, is identified variously as Mary Plantagenet, Mary of Lancaster, … of Bedford, … of England. Remembered in history as the Duke of Bedford, her father, John of Lancaster (1389-1435), was appointed regent of France (1423-1433) for his nephew, Henry VI, and then regent of England (1433-1434). He was to become the first of the two royal-blood Dukes of Kendal in the 14th century; for the third duke, Jean de Foix, see note 7, in Part Two. For the fourth, we again encounter royal blood, in the early 20th century (Bailey, 2006: 34).

Baurein (I, 157) states that her dowry was 500 *livres tournois* in lands and guaranteed income. With the duke's death before all the dowry was transferred, Pierre de Montferrand became in part dependent upon the good graces of the English king Henry VI, the duke's universal heir.

[25]By incorrectly stating that Pierre II, this son of Bertrand III and Na Isabeau, died after August 1437, the Internet source "Montferrand" (7) creates confusion for where his story picks up (10). Being the eldest child of a 1410 marriage, Pierre II de Montferrand would not normally have a grandson old enough to marry before 1435. "Montferrand" has most probably confused his date of death with that of his mother. Pierre I de Montferrand, then, would not be the unnumbered "Pierre" on page 7, but rather the Pierre-Amauvin de Monferrand (d. before 1349) of page 1.

examine the genealogies of these allied families. Just who were the proprietors of the châteaux de Montferrand and de Landiras?

The Genealogies

These genealogies seek two objectives together, both important: one is to show the most accurate names, titles and dates the current author can unearth; the other is to indicate the discrepancies in the secondary sources. The hope is that readers will know, if not whom to trust, then at least where any given source differs from others. The best known, with its extensive family tree, is that by Arnaud Communay, and it will form our base for the Montferrands. Unless a source states "born in" or "died in", there is occasional uncertainty about whether shown dates are regnal or life. Taken at face value, some of Communay's dates suggest an heir's possession of title during a father's lifetime! Where alternate suggestions lack, I have simply reiterated what dates are offered, even though several simply cannot conform to other dates offered by the same source. (For example, a person cannot marry earlier than he or she is born!) Sometimes accepting Communay, sometimes not, scrupulous attention has been given to whether the precise title be *seigneur*, *baron* or *vicomte*.

Numerous duplications of names and numbers, both from cadet houses and from merely similar names held by scattered siblings, have seriously misled impatient genealogists. Furthermore, "Jean" is occasionally named "Jehan"or "Jehannot"; Bertrand, Bernard & Bérard same interchangeable, as do Amaubin, Amaudin, Arnaudin & Almalvin. Also marriage to cousins related through females often goes unnoticed. For all these reasons, I have tried to recover younger siblings, including females, and to indicate clearly the connections. With some hesitation, I have offered the names of wives hitherto largely unknown, as well as including some rarely mentioned earlier or later wives who left no succession. Then, what about numbers? To get three "Jean"s before our Jean IV (Jehan de Landiras), we have to count two in the Cancon branch, the latter being Jehan's contemporary. But François IV de Landiras is older by a century than François II and III in the Cancon branch; and Pierre II de Landiras, the same with respect to Pierre I in the senior branch! Are the numbers just Communay's arbitrary way of working from left to right across his table?A further challenge is to trace titles, for a male is conventionally identified/listed as possessing titles and properties that only entered his supervision by marriage (that is, not inheritance from either parent).

Naturally, many disagreements among the sources were of some significance. Internet sources, especially Wikipedia and several enthusiastic genealogists, have been an immense (not always acknowledged) assistance in adding to or correcting printed sources, but they present so many uncertainties and contradictions that they, too, can only be used with great care. (Amateur genealogists can be fine and tenacious antiquarians, but they may also lack the historian's skill in judging what they've found.) Many of the abundant dates are only approximate, and some no doubt incorrect—and so a challenge for my successors to rectify. The large Roman Numerals denote generations (Communay); the occasional immediately following Arab Numerals denote where siblings succeed one another (Bailey).

The Senior Maison de Montferrand/Montferran/Montferrant

I. **Tiso de Barès (or Wareys)** (documented as a living adult in 1168)
"Varèze" or "Varesio" (Courcelles, 1826: VI, "de Goth ou de Gout", 17).
[one or two missing generations]
II.* **Amanieu de Barès,** *écuyer*, sgr de Montferrand (1242-1255); "GeneaNet" (not in Communay),
(d. 1242) Abbot (n.d.: 327)
II. **Amaubin/Amaudin I de Barès** (1242-1271), *sénéschal* de Lannes (Could Amanieu and Amaubin be the same person?)
= Gaillarde de Castillon
Brother: Étienne de Barès (1278-1283) = Marguerite de Castillon m.s.p.[26]
III. **Amaubin II de Barès** (1265-1280), baron de Montferrand in 1265
= Marguerite de Preissac[27] (Pressac—Grasset: 51; Marquèze de Prechac—"GeneaNet")
Brother: Tridon de Barès (fl. 1265) plus five other siblings without posterity
= ??? d'Anglade
>son Arnaud de Barès (fl. 1331) = ??? de la Roque
>dgtr Renaud de Montferrand, sgr d'Aiguille (1363-1397)
= ??? de Chabannes
>son Guillaume de Montferrand (1391-1399) m.s.p.
OR: Amauvin II le Jeune de Barès (ca. 1260-1285)
= Gaillarde (?) de Montferrand
IV.* **Pons de Montferrand** (1250-1312)
= Thalèse de ??? (b. 1267) (These dates from "Généalogie mes ancêtres")
Pierre Armauvin III is **their** son (which would make him "V")
(These three paragraphs from"Informations généalogiques" and "Arbre généalogique").
IV. **Pierre-Amaubin/Arnaudin III de Barès** (1280-1339/49), brn de Montferrand[28]
Or **Almalvin III de Barès** (Courcelles: VI, "de Goth ou de Gout", 17).

[26]"M.s.p." = "mort sans posterité" (died without issue). Below: "N. de …" = name unknown.
[27]I am unable to place Marguerite de Preissac, let alone connect her with the line we meet later. Cf. Gastelier de la Tour (1770).
[28]Alternately, Pierre Amauvin (1290-1349), marriage in 1308, with Indie dying in 1328 ("Arbre généalogique de Jean Michel Ducosson"). Though also possessed of errors, this site presented the entire family tree and sometimes filled in gaps below, most notably life dates for Isabelle de Preissac.

= 1303 Indie/Inde de Goth/Got/Gout (d. 1324/35);[29] or 1285-1328 ("Mes arbres")
brings in the *baronnie* de Veyrines/Vérines; mother of succession
= 1330/40 Mabille de Colomb (1333-1371)—neither mrg. date fits suggested life dates!
(her full name, dates, and later mrg. date from "GeneaNet")
Brother (?): Amalvin de Varèze (b. ca. 1314), sgr de Montferrand = 1328 Yolande de Pons

V. **Bertrand/Bérard/Bernard I de Barès** (1320/24-1351) or ca. 1310-1351 ("Mes arbres")[30]
brn de Montferrand & *châtelain* de Blaye-et-Sainte-Luce; knighted in 1345
= ca. 1335 N. de Durfort (b. ca. 1315/20) (Régine de Durfort, dgtr of sgr de Blanquefort*)
Brother: Amanieu

VI. **Bertrand II de Montferrand** (1345/50; baron 1365-1409/10), *chevalier banneret*
—the first to replace "Barès" by "Montferrand" as the **family** name*
= ca. 1365/70 Rose d'Albret (1355-1393), *dame* de Pondesac

VII. **Bertrand III**[31] **de Montferrand** (1380; baron 1409-1435/46), brn de Langoiran & de Veyrines,
sgr d'Agassac, de Soussans de Podensac, & sr de Rions, *châtelain* de Blaye, *sénéchal* de Guyenne,
chevalier de l'ordre Jarretière ("Order of the Garter"),
gouverneur de Marmande (d. 1446*[32])
= before 1409 Isabeau de Pons ("Informations généalogiques")[33]
= April 1401 (Communay, xxi; & for April, Grasset, 51)[34] Marguerite d'Astarac (1385-1410);
Or 1382-1404 ("GENI"); mother of elder, Montferrand succession
= 1410 (Communay & Grasset, 51); 1408 (Bourrousse de Laforre, 1883: IV, 241);
1409 (?) Isabeau/Isabelle de Preissac/Pressac (1390-1437); mother of junior, Landiras succession
Bertrand III's brothers & sister (with *Maison d'Uza*):
Jean (d. 1410), never properly archbishop of Bordeaux [see note 23, above]
VII. *François I, sgr de Montferrand* (d. bf. 1456)—*Maison d'Uza (or Uzar)*
= ca. 1415 Jeanne/Jouine/Jouyne Sans de Pommiers (ca. 1390-bf. 1457),
vicomtesse de Fronsac et *d'Uza*, *dame* de Belin & Biscarosie
Or no known wife ("Informations généalogiques")
[VIII.] *Bertrand/Bérard de Montferrand & d'Uza* (ca. 1415-1471)[35]
= ca. 1445/47 Marie de Lalande (af. 1488), (see note 38)
(two later marriages for her)
Brother: Jehannot de Montferrand (b. bf. 1425)
= 1435* Johanette de Foix (b. bf. 1425*)
>son Bertrand* (*="Informations généalogiques")[36]
[IX.1] *Catherine de Montferrand, vicomtesse* d'Uza from 1469
= 1466 Gilles d'Albret, sgr de Castelmoron m.s.p.
[IX.2] *Isabeau de Montferrand, vicomtesse* d'Uza (b. 1459)

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[29]It may be worth pointing out that Indie's mother is sometimes identified as Miramonde de Mauléon (d. ca. 1348), who was, however, to be her father's second wife (mrd. May 1309) and who bore him no children. Arnaud-Garcie de Goth (1245/50-ca 1312) had married Blanche de Mauléon (1250-1286) in 1269, who bore him nine children. Initially, Anselme, vol. II, simply lists Miramonde as de Goth's wife, but in vol. IX of the 3rd ed. (1733), "Additions et Corrections", he cites/adds Blanche as the first wife and mother of the children (382). For Blanche's dates and family name (or is this another confusion with de Goth's second wife?—cf. next paragraph in this note), see "Généalogie Famille de Carné". She has been also named Blanche Lambert (1255-1309) ("Mes arbres"). "1386" was once mentioned as her date of marriage. Would Blanche and Miramonde have been sisters or aunt & niece? For more on Indie de Goth, see note 16 above.

Does another source blend these women by naming de Goth's first wife "Blanche (Mirland) de Mauleon" (b. ca. 1248, mrd. 1269)? The husband in this case is called "Arnaud-Garsie de Lomagne, vicomte de Lomagne & d'Auvillars" (ca. 1250-1312), who sired among other children an illegitimate son "Arnaud-Garsie de Goth" (ca. 1285-after 1339)! "Our Royal… Ancestors". Let us note that the *vicomte* de Lomagne is elsewhere identified as "Arnaud-Garsie de Goth"; these needn't be different persons! Note: Garcie/Garsie.

"Généalogie mes ancêtres" (a site I cannot find now!) also dates Bertrand's birth to 1310.

[30]Speaking of the husband of Marguerite d'Astarac, but perhaps subsuming his father & grandfather too, Communay (xxi) writes that "Bérard" and "Bernard" can sometimes be found for the more common "Bertrand".

[31]These three asterisks (in V., VI. and VII.) denote information from Grasset, 1988: 51.

[32]A Dutch Internet genealogy offers interesting, sometimes disparate details. First, it is virtually alone in denominating the family as barons of "Saint-Louis-de-Montferrand", which does link the family to the site of their château. (In fact, the commune officially dropped "Saint-Louis-de-" from its name only in the French Revolution, during the *Convention nationale*, 1792-1795.) Second, almost every person has slightly different dates from those suggested above: Pierre-Amaubin III (1285-1345), Bertrand I (1315-1350), Bertrand II (1345-1409; marriage in 1475), Bertrand III (1380-1445). "Genealogieonline".

[33]"Informations généalogiques" alone offers this earlier wife, Isabeau de Pons.

[34]Alternative mrg. dates for Marguerite d'Astarac: "before 22 March 1394, old style" (Baurein: III, 75), possible, but rather early; bf. 1409 ("Informations généalogiques"); 1446 (!), ("Ahnentafel, #774").

Did Marguerite d'Astarac have two sons, Pierrre, sgr de Soussans, and Jean ("Cdelmars", "Informations généalogiques" & "RootsWeb")? These sources are aware that Isabeau de Priessac had a Pierre by Bertrand III as well. But nothing further is anywhere said of this earlier Pierre.

[35]Bertrand's becoming a prisoner of the English [*sic*, not "of the French"?], the marriage was not immediately consummated. Bertrand's sister, Isabeau de Montferrand, married Guischarnaud de Saint-Martin. Most of the information concerning Bertrand (Bérard) and his d'Uza descendents comes from Courcelles (1825: V, "d'Uza", 41-44, a note: "Fragment sur la Maison de Montferrand").

[36]A natural daughter of Gaston de Foix, Johanette de Foix brought the *seigneurie* de Fargues to the Montferrands (Baurein: III, 231-32). Communay's table says no issue. (Would the mother's illegitimacy have denied the inheritance to her off spring?) OR: is Jeannette the wife of Jehannot's cousin Jean I? In either case, her son is named Bertrand.

= 1472 Pierre II de Lur, brn de Longa (1462-1515)[37] (Cf. Maison de Cancon)
David, bishop of Dax, 1406 or '08; archbishop of Bordeaux (1413-1429/30)
Jeanne = 1408 Jean II de Lalande (1375-1420)[38]
Marguerite = sgr de Massidan

VIII. **Jean I de Montferrand** (b. 1404/10; baron 1435-1442) or b. 1402 (Chenaye des Bois: V, 418) or 1405 ("Cdelmars"); or d. 1441 ("Cdelmars"; Abbot, 237); killed at siege of Langon[39]
= ca. 1420 unknown woman (Communay, Table; "Informations généalogiques")
Or = 1435 Jeanne/Johannette de Foix ("Cdelmars")

IX. **Bertrand IV de Montferrand** (1435; baron 1442-1474), brn de Langoiran (till ca. 1454) sgr de Margaux (from 26 May 1447[40]), *conseiller et chambellan du duc* de Guyenne
= ca. 1450/54 Jeanne de Luxe
Sister: Catherine de Montferrand (b. ca. 1420/22) = 1440 David de Faubournet
("Arbres Généalogiques / Ducusson"—the earlier birth date and date of marriage)
>son Jean de Faubournet, sgr de Montferrand & Puybeton (ca. 1445-ca. 1572)
= 1481 Bernadine de Lavedan (ca. 1450-after 1517)
("Généalogie Famille de Carné; Chenaye Des Bois, V, 418)
>dgtr Marguerite de Faubournet-Montferrand
= 1499 Pons de Gontaut, brn de Biron, as his second wife
>son Jean I de Gontaut, sgr de Montferrand[41]

X. **Gaston I de Montferrand** (1454/71-1498/1504), *conseiller et chambellan du roi* de France, *gouverneur* de Bourg, *sénéchal* de Bazadais
= 1473 Catherine de Lescon (b. 1463?!)
= 14 mars 1483 Jeanne/Jehanne de Maingot de Surgères; mother of next generation

Gaston's brother & his descendents—*Maison de Cancon*:

X. *Jehan/Jean II de Montferrand*, (b. af. 1454), *vicomte de Foncaude*,[42] sgr de Castelmoron et Gironde (Grasset: 113)
= 1494 Louise de Juge (ca. 1480-af. 1520), *comtesse* de Castres[43]

XI. *Charles III de Montferrand-Cancon-Foncaude* (af. 1494-ca. 1557)
= 1526 Marie de Verdun de Hautesvignes, *dame de Cancon*
> dgtr Marguerite de Montferrand mrd Charles II de Montferrand of the senior branch, her distant cousin
> dgtr Marie de Montferrand-Cancon married Louis de Lur, *vicomte* d'Uza (1535-1573), grandson of Pierre de Lur and Isabeau de Montferrand, *vicomtesse* d'Uza[44] (Cf. d'Uza)
Other Siblings: of three brothers, David de Montferrand (af. 1494–af. 1562), *comte* de Castres
= 1529/30 Marie Dubedat/de Bedat
>son Raymond (Robert) de Montferrand (d. 1621) ("Informations généalogiques")
= Marthe de Cours; and then Marie de Lamouroux
>dgtr Jeanne ("Arbre généalogique")[45]

XII.1. *Jean III de Montferrand-Cancon-Foncaude* (af. 1526-1595)
= 1556 Barbe de Pons (1520-1595) m.s.p.

XII.2. ***François II de Montferrand-Cancon-Foncaude*** (ca. 1536-1625), succeeded senior Montferrand branch in 1591
= 1577 Claire de Pellegrue (b. bf. 1562)

XIII. ***François III de Montferrand-Cancon-Foncaude*** (af. 1577-Oct. 1660),[46]

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[37]Isabeau being only thirteen years old, the marriage was not consummated till 20 January 1474. Pierre was born of Marie de Fayolle (b. 1415), Bertrand II de Lur's second wife (Courcelles: V, "de Lur", 40-41).

Earlier, the same source mentions the grandson of Bertrand's first wife, Jean de Lur (son of Bertrand III & Catherine de Gontaut-Biron) as married to an Isabeau de Montferrand (*Ibid.*, 27 & 32), a woman we cannot identify. Is it possible that this apparent uncle Pierre/nephew Jean should be seen as the same person?

[38]Their granddaughter, Marie de Lalande (daughter of Jean III and Jeanne de Foix), married her father's cousin, Betrand/Bérard de Montferrand-d'Uza.

[39]I can date specific sieges of Langon (& Blaye) to 1339 & 1345 [*sic*], but to resolve the disagreement of sources about Jean de Montferrand's death, the best I can say is that Charles launched a major offensive in Guyenne in 1442! In his Introduction, Communay (xxv) dates Jean's death to 1471 (typo for change to 1441?).

[40]Baurein: II, 93. The *terre* de Margaux was a dependency of the *châtellenie* de Banquefort (*ibid*., 94).

[41]John I de Gontaut was the last in this line to bear the Montferrand title. (Courcelles, 1822: II, "de Gontaut-Biron", 22; Chesnaye Des Bois, II, 285; Anselme, II 22; Moréri: I, 896—for this point & others in the text above).

Concerning Bernadine de Lavedan (Jean de Faubournet's wife) see François IV de Montferrand-Landiras (note 67).

[42]Whence and when the *vicomté* de Foncaude? Communay has an entire chapter III, "Vicomtes de Foncaude" (li-lxiv), in which he just ascribes the title to Charles III & Jean III (lvi-lvii) without anywhere explaining its origins. He has Charles cede Foncaude to his brother David (82-84).

[43]This marriage was arranged by Louise's mother, Marie d'Albret, but opposed by her father, Boffile de Juge, *comte* de Castres (Communay: 47, where he erroneously names the groom "Charles", rather than the correct "Jean" (*ibid*., 39).

[44]Courcelles writes, without correction (!), that it is believed Marie was the last of the Montferrand-Cancon line (1825: V, "d'Uza", 47, n. 1). Marguerite and Marie had another sister, also named Marguerite (who married Jacques deigneur [*sic*] Angevyn), and two brothers. ("Informations généalogiques").

[45]"Arbre généalogique" presents David as if he were his father's uncle.

[46]"After 1572", offers "Informations généalogiques", for François III's birth, yet the same source and all others have his parents marry only in 1577.

premier baron de Guyenne, *conseiller du roi*
= 1625 Jacquette de Beauxoncles (bf. 1616-1635) m.s.p.[47]
Or mrd. 27 Oct. 1526 ("Arbre généalogique/André Decloitre")

XI. **Pierre I de Montferrand** (1513-1547) —Pierre is missing from Abbot (327)
= ca. 1508 Marie/Madelaine de Carmain et de Foix

XII. **Charles I de Montferrand** (1513; baron 1547-1548)
= 15 or 19 March 1534 Françoise d'Aydie de Ribérac (a widow)
demoiselle de la chambre de la reine (Communay, xxxiv; Grasset, 113)

XIII.1. **Charles II de Montferrand** (d. 1574/5),[48] *premier baron* de Guyenne,
maire et gouverneur de Bordeaux (1569-??)
= 1574 Marguerite de Montferrand (Charles's cousin)[49] m.s.p.
Siblings: two brothers died young; Catherine = Jean de Laminsans, brn d'Auros
>dgtr Catherine = Jean d'Achard des Augiers, sgr de Mauconseil & de Villeneuve
>son, Charles Achard, tried to claim the château & *terre* de Montferrand in 1591 (Communay, xliii, note 1)

XIII.2. **Guy/Gui de Montferrand** (ca. 1540; baron 1575-1591),[50] *chevalier de l'ordre du roi*
= Jeanne d'Eschelles (d. 1594); "Dechelle" (Grasset, 113 & 115)
(Son Gédéon died a month before his father[51])

THUS, the titles and remaining properties passed to *François II de Montferrand-Cancon-Foncaude* (d. 1625), (see above), a distant cousin. François II's son, *François III*, died in October 1660 without heirs, and all passed to the Maison de Landiras.

The pre-Montferrand Maison de Landiras/Landirans/Landirats

I. **Rostand/Rostang/Rustand de Landiras** (documented as living in 1173)
[one or two missing generations?]

II. **Rostand ?? de Landiras** (documented as living in 1236)
[one or two missing generations?]

III. **Rostand ?? de Landiras**; brother of …

IV. **Isabelle de Landiras** (1230/35-ca. 1279) = Gaillard de La Mothe (1230-1279)[52]

V. **Clairemonde/Esclaremonde de La Mothe-Landiras** (ca. 1260-1301 or af. 1328)
= 27 September 1280 (?) **Jean Roussel de Saint-Symphorien**[53] (b. bf. 1269);
after 1307/8 exercised the rights of high and low justice in the parishes of Illats,
Lassats, Guillos, Brachs, & Saint-Michel-de-Ruifreyt

VI. **Gaillard Roussel de Saint-Symphorien,** sgr de Landiras (1279/80-1340),
in 1340 received the same rights of high and low justice in the parishes mentioned as had his father,
again in 1342 (Baurein: III, 83);
in 1338, the *seigneurie* de Blanquefort was transferred to him by the king of England after Gaillard de Durfort's "treason"
= Jeanne de Vaux (Buathier, 1995: 71)[54] or
= 1309 Jeanne de Soler (b. 1299)[55] [most sources say "an unknown woman"]

VII. **Jean II Roussel de Saint-Symphorien**, sgr de Landiras (ca. 1310/20-????)
= January or July 1343 Na-Aupeys de La Mothe et de Roquetaillade (b. bf. 1333)[56]
Or Na-Alpais ("Ahnentafel" #6206)
Brother or Half-Brother: Pierre de Saint-Simphorin [*sic*] (d. 1382)

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[47]François III de Monferrand-Cancon-Foncaude had a younger brother of the same name (ca 1597-1620), who had become a knight of Saint-Jean de Malte/St. John of Malta.

[48]Let us note here that while Féret (III, 468-69) seems to have an accurate grasp of essential events, he skips generations and assigns Charles II's exploits to "Gaston II". Or is this last just a typo or a jumping over to the Landiras branch?

[49]She was the granddaughter of Jehan II de Montferrand, baron de Cancon & *vicomte* de Foncaude, the brother of her husband's great-grandfather, Gaston I de Montferrand (and so from another cadet branch of this senior house).

Thus, we can see that the dynastic strategies of aristocratic marriages sometimes stretched Church law against marrying even moderately distant relatives. (Only one source mentions papal dispensation for marrying a cousin.)

[50]When Charles II succeeded to Montferrand, etc., Guy succeeded to the barony of Langoiran (Féret: III, 468).

[51]Yet on 8 March of the year of father's and son's deaths, Gédéon sold four *chevaux de guerre* (Communay, Doc. XLIV, 125-26).

[52]"Les Seigneurs de Landiras_1" states that Gaillard de la Mote [*sic*] became sgr de Landiras in 1284; with seneschal Jean I de Grailly marrying Clairemonde de la Mote the following year; and Jean Rossel [*sic*] receives the *seigneurie* from Edward III [*sic*] in 1315. If we allow Gaillard (and Isabelle) to live so long, he could be so recognized, whether as husband or as widower in place of his daughter; and recognition by Edward II would not be unwelcome. But otherwise, this is all erroneous.

One source has Gaillard de La Motte related to the de Goth family, which we've met above.

[53]Many sources have Jean Roussel married by 1290, yet born ca. 1320! Of these, only one offers for him another (earlier than Clairemonde?) wife, namely Alpais de La Mothe ("Ahnentafel", 13th generation, # 6206).

[54]"Buathier gives Gaillard & Jeanne three children: Jean, Pierre and Agnès. If sought independently, however, the only "Jeanne de Vaux" to be found on the web married a Louis de Montalembert in 1450—over a century later!

[55]Most sources marry Gaillard in 1309 to Jeanne de Soler and give them only a son, Pierre (d. 1382).

Another source gives Pierre to Gaillard & Jeanne de Soler, while ascribing a half-brother Jean to Gaillard & no named mother. Buathier does include a second marriage, in 1309, to Jeanne de Soler. "Informations généalogiques" gives only the latter marriage for Gaillard Roussel. In short, the identity of Jean's mother is uncertain.

[56]Birthdate for Na-Aupaïs de la Mothe & precision of marriage to 16 July 1343 (Buathier, 71).

"otherwise called de Landiras, *chevalier*" = Marie de Colomb (1325-1393)
part owner of the Isle-Saint-George by a title of 1374 (Baurein: III, 37).
>dgtr Marie Roussel = Jean I de Lalande (1340-1407)
>son Jean II de Lalande (1375-1420) = 1408 Jeanne de Montferrand[57]
>son Jean III de Lalande (1409-1491) ("GeneaNet")

VIII. **Isabelle/Isabeau/Ysabé de Saint-Symphorien**, *dame* de Landiras (ca. 1345/50-1391 or 1408 or 1424)[58]
= 1358/66 **John of/Jean de Stratton** (ca. 1340-1395) or **Estratonne** (Baurein: III, 80).
(In Baurein, IV, one also finds "Destratone" and "Destratonne".)
or d. bf. February 1400 ("Branches ... des Montferrand" [2])
châtelain et connétable du château de Bordeaux (Baurein: IV, 289)
[perhaps the builder of the imposing château de Landiras (Lemay, 1995: 765)]

IX. **Marguerite de Stratton-Landiras** (ca.1370-1424/27), *dame* de Saint-Symphorien-Bazadais
= **Bernard- (or Bermond-)Arnaud) de Preissac**[59] (b. ca. 1350), ("Préchac" in the Gascon Rolls),
soudan/*soudic* de La Trau,[60] sgr de Didonne, de Portets, d'Arbanats, & de Lesparre, etc.,
grand-bailli de Marennes, *gouverneur* de Montagne, *chevalier de la Jarretière*

X. **Isabeau de Preissac-Landiras** (1390-perhaps 1437), *dame* de La Trau, de Portets, de Lesparre,
d'Uzeste & de Saint-Symphorien-Bazadais; "Isabeau de La Trau"(Baurein: I, 157); (mother of Pierre II)
= 1410[61] **Bertrand III de Montferrand** (earlier marriage to Marguerite d'Astarac, mother of Jean I)

The Cadet Maison de Montferrand, Seigneurs de Landiras

XI. [if numbering as from the Landiras lineage, but in order to align with the Montferrand generations ...]

VIII. **Pierre II de Montferrand-Landiras** (af. 1410-1454) [younger half-brother of Jean I de Montferrand],
soudan de La Trau, *dit* brn de Lesparre,[62] de Langoiran & de Landiras, sgr de Portets,
d'Arbanats, de Uzeste, de Daurange (d'Audenge?), de Daureigne (d'Origine?),
de Guillac, de Saint-Michel de Rivière-Froid, & *du péage* de Guillos,
sieur de La Tour de Bessan,[63] *gouverneur* de Blaye
= bf. 1435 Marie Plantagenet de/Mary Plantagenet of Lancaster/of Bedford/of England (1420-1459/63)
Siblings: Pierre **or** Pey de Montferrand le jeune (Communay) **OR** Bertrand,
baron de Montferrand, de Frespech, de Langoiran, etc.
(Bourrousse de Laforre: IV, 241), (d. 1437) m.s.p.;
Jeanne (Gaillarde); Marcotte;
Isabeau de Montferrand (1415-1464) = 1435 François de Gramont (ca. 1410-1462);
and Marguerite de Montferrand = (?) Jacques Angevin, sgr de Rauzun, Civrac, Pujols, Bladignac, etc.?
(Courcelles: VI, "de Durfort", 143, n. 1)
>dgtr Jeanne Angevin = Jean de Durfort, *chevalier*, sgr de Duras & Blancquefort,
mayor of Bordeaux, who became governor of Cremona during the Italian invasion

[57]Daughter of Bertrand II de Montferrand and so sister of Bertand III & sister-in-law of Isabeau de Preissac, *dame* de Landiras (see below).

[58]At least two sources identify Isabelle's father as Gaillard rather than Jean II, thereby confusing father and grandfather. Baurein identifies Na-Aupuys as daughter of the *dame en partie* (so, heiress in part) de Roquetaillade, sister of Pierre de la Mothe, sgr. de Langon. (Are this sister and brother in any way related to Clairemonde de La Mothe-Landiras, the grandmother of the husband of their daughter/niece?) Baurein spells the mother's name "Na-Aupays" & the daughter's "Ysabé de Saint-Simphorin" (III, 207). Baurein references a document of 7 April 1424 that refers to *both* mother (Isabeau) and daughter (Marguerite) as "Dames de Landiras" (III, 208), which need be only to establish a point, not an indication that the mother was still living. Without equivocation, Baurein dates the Saint-Symphorien-Stratton marriage to "as early as 1358", and for their longevity, gives us the date 1391, actually for both spouses (III, 207/8).

Alternatively: "Isabeau, *dame* de Landiras, Bessan de St-Symphorien" (ca. 1250 [*sic*]-ca. 1424); John Stratton, "constable de Bordeaux, sr de Landiras" (ca. 1350-ca. 1400); married in 1366 ("Ahnentafel", 12th generation, # 3102 & 3103).

[59]"Bernard Arnaud de Preissac, knight (*chevalier*), captain of a company of *hommes d'armes*, …, was one of the most valiant warriors of his century, contributed immeasurably to the victory of the battle of Cocherel, where he fought at the head of the Gascons on King Charles V's side, was there badly wounded and received from the king the most striking marks of his gratitude and was a guarantor (*conservateur*) of various treaties between France and England" [my translation] (Chenaye des Bois: ?, 508, quoted in "Montferrand"). Cocherel was fought 16 May 1364, between the kings of France and Navarre (with some English on the Navarese side).

[60]The château de La Trau had been built by Pope Clement V and turned over to Arnaud Bernard de Preissac (d. 1310), his brother-in-law, as governor, but under the recently-new-to-Europe title of "soudan" (from "sultan"—sometimes "soudich"). Bacque translates the title as "défenseur" (1908: 19). Bernard-Arnaud de Preissac was his great-grandson (Beltz, 1841: 265, note 1, & 268). By 1384/5 Richard II of England had given permission to hold a market and fairs in Arbanats/Darbenatz, a parish in the jurisdiction of the baronnie of Portets (Betz: 268; Baurein: III, 75). Bourrousse de Laforre reiterates the titles of Bermond-Arnaud de Preyssac, but with the spelling sgr. "d'Arnanats" (1883: IV, 241).

[61]For the various suggestions for dating the Montferrand-Preissac marriage, see note 34, above.

[62]Bertrand III had claimed Lesparre in right of his wife, Isabeau de Preissac, but was awarded Madaillon as indemnity. Pierre raised the claims again, and was given Langoiran instead in 1446. Henry VI gave Lesparre to John Holland, Earl of Huntingdon; Charles VII awarded it in 1450/51 to Amanieu d'Albret, sr. d'Orval (d. ca. 1463). Communay (????); Baurein (I, 159-60); Abbot (325), who alone mentions Huntingdon; Ribadieu gives Huntingdon as an example of how the English king sowed disputes among his vassals (1990: 192). Lost in Pierre's demise of 1454, Langoiran was retrieved by his nephew Bertrand IV and later sold by Guy de Montferrand in 1590 to meet debts (Abbot, 323). Alternately, Bertrand IV possessed Langoiran and was responsible for the (temporary) loss; it was sold by Gaston I on 28 June 1578 (Communay: Doc. XLIII, 121-25).

[63]This extensive list is owed to Communay (1). But after Landiras, he introduces his list merely by "ensemble des terres…", so not each item that follows need be considered a *seigneurie*, most notably not the "*péage*" (toll gate). Of course, we have his and many others' authority that most are. (Elsewhere, giving all the sometime possessions over the centuries, he lists *seigneuries* and *maisons nobles* together [vii]).

IX. **François IV de Montferrand-Landiras** (ca. 1440-1501), sgr de Budos[64] & de Cernés (Saint-Léger-de-Balson)[65]
= ca. 1470 Yolande Carrion (b. ca. 1450)[66] OR Bernadine de Lavedan (ca. 1450-af. 1517)[67]
Siblings: Thomas, sgr d'Aigille (d. ca. 1470), Bertrand, sgr de Montbadon (d. ca. 1470),
Mathilde (yet Communay says all "died young")

X. **Thomas de Montferrand-Landiras**[68] (1470; baron 1514-1523/40), d'Uzeste and Portets:
= ca. 1500 Unknown woman OR Yoland Carrion (b. ca. 1450)
Siblings: Perre [*sic*] (b. 1469), Catherine & Jeanne

XI.1. **Pierre III de Montferrand-Landiras** (d. 30 May 1540) m.s.p.

XI.2. **Gaston I de Montferrand-Landiras** (d. 1540)[69] m.s.p.

XI.3. **Jehannot de Montferrand-Landiras, *baron de Portets*** (1501-1561) (or b. 1510),[70]
("Cdelmars"; "GeneaNet"; & "Arbre généalogique")
= 1535 Marguerite de Grignols/Talleyrand-Grignols (ca. 1520-bf. 1561),
(Communay, "Cdelmars"; "GeneaNet" & "Arbre généalogique")[71]
mother of Portets succession (viz. Gaston *et seq*.)
= Françoise de Pompadour (d. 1580)
XII. *Gaston de Montferrand-Portets* = ???
XIII. *Mathurin de Montferrand-Portets* m.s.p.

XI.4. **Jehan/Jean IV de Montferrand-Landiras** (1505; baron 1559-1573/80)[72]
admitted to the *ordre de Saint-Michel* in 1570[73]
= 1545 Jacquette de Rayet

XII. **Gaston II de Montferrand-Landiras** (d. early 1597)
= 1573 (Saint) Jeanne de Lestonnac (1556-1640)
Siblings: Barbe; Marie = Bernard de Faverolles, sgr de La Planche;
Catherine = Antoine de Chanteloube, sgr de Branda;
Marguerite = François de Sentout

XIII. **François V de Montferrand-Landiras** (1580-1619/20), sgr de St-Morillon, *bourgeois* de Bordeaux,
*gentilhomme ordinaire de la chambre du ro*i in 1603, *capitaine d'une compagnie des chevaux légers*[74]
= 3 July 1600 Marguerite de Cazalis (1583-1620)

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[64]Given that the Montferrand-Landiras patrimony would fall to the La Roque-Budos family in the middle of the 18th century (cf. note 30, in Part Two), this earlier, brief ownership of Budos should be noted: André de Budos's loyalty to the King of France cost him his lands from 1421 until his son's repossession in 1460. In 1440, the English crown had assigned the *seigneurie* to François IV de Montferrand, who, in the 1443 Capitulation of Dax, however, promised to render Budos, Castelnau and Cernés to Charles VII. Instead, François preferred to offer his son Bérard as hostage than to execute the terms of the treaty. Nonetheless, in 1446 the château de Budos was assigned (temporarily) to Jean, comte de Foix. Bacque (1908: 19) (I offer these details in faith even though the same source has Jeanne de Lestonnac born in the château de Landiras and founding her Order in Toulouse! Furthermore, Bérard de Montferrand appears to be the hostage of the English king, when the post-Dax circumstances would suggest the French?!)

[65]"Les Seigneurs de Landiras_1", indeed, lists Saint-Léger-de-Balson in parenthesis after Cernés.

[66]Yolande Carrion married François IV according to Communay (table). Their children and some dates were confirmed by "RootsWeb's WordConnect Project".

[67]"Arbre généalogique" and "Informations généalogiques" give Yolande Carrion to Thomas de Montferrand and assign Bernadine de Lavedan to his father. Both women would be a little old for marriage to Thomas. However, these respective assignments of Yolande and Bernadine do happen often enough for one to be cautious in denying either's accuracy.

For another Bernadine de Lavedan, see Bertrand IV de Montferrand, in the senior house. A third Bernadine married Jean/Jeannot de Montault (Anselme: ?, 605; Chenaye Des Bois: ?, 262). "Bernadine" appears to be one of the fifteen most frequently given names within the Lavedan family ("Généalogie.com"), and we have found both 1450 and 1460 given to one or another Berdadine de Lavedan who died in 1517. "Our Royal … Ancestors".

[68]"Les Seigneurs de Landiras_1" inserts a Gaston, *sénéchal* de Guyenne in 1465 between François and Thomas.

[69]One source ("Informations généalogiques") offers no wife or date of marriage for Gaston I de Montferrand-Landiras, but gives him two children (Gaston II and Pierre), who are more likely those of his youngest brother, Jean IV.

[70]If Jehannot really was born in 1510 (and "Jean IV" in 1505), we have a better explanation for why it would be Jehannot who established a cadet house. That is, Jehan (Jean IV) would follow the two elder, deceased brothers into the succession, while the younger, fourth brother, Jehannot, would have to be content with an appanage or two, as per the 1559 agreement mentioned by Communay (lxx). Then, should Jehannot figure in the Landiras succession at all, let alone before Jehan/Jean IV? They could have been co-proprietors. Anything is possible, of course, so an elder brother might have, for one reason or another, decided to establish a cadet line. Cf. note 14, in Part Two.

[71]The date of marriage is from Courcelles: III, "de Grignols", 260.

"Talleyrand" is included only by Communay (lxx), but not without probability; the comté de Grignols had been in the Talleyrand house since "time immemorial" (Courcelles: III, "de Grignols", 258).

"GeneaNet" offers a marriage date of 1513 (which brings it into striking clash with the only known suggestions of her birth date, *viz*. 1520, let alone her husband's), and then as much as offers her brother-in-law (Jean [IV], "co-seigneur de Landiras") as her first child. Then, three more children: Gaston de Montferrand (father of Mathurin [which matches other information], Isabeau and Marie de Montferrand), Jacquette de Montferrand (to be wife of François de La Cropte sr de Meinardie, and then mother of Jeanne de La Cropte), and Isabeau de Montferrand (to marry Raymond de Fortebride).

[72]A largely reliable source nonetheless has Jean IV die in 1563 ("Informations Généalogiques"), when most have him present at his son's wedding ten years later.

"Montferrand" does not help us keep the family's succession straight during these generations. Among other things, it merely indicates that Jean de Montferrand-Landiras had posterity and then inconsistently suggests that his second-oldest brother, Gaston I, was the father of Gaston II (11-12).

[73]"Jean de Montferrand" is listed for 1571, with the title "sgr de Portelz [*sic*]" (Colleville & Saint-Christo, n.d., 109), which would suggest his brother Jehannot, but **he** had died in 1561. Cf. note 14, in Part Two.

[74]Identified as "Bourgeois de Landiras de Montferrand" by "GeneaNet/François", a site which furnishes several additional dates for the next few generations. Also by "Les Auschtzky de Bordeaux".

Sisters: Marthe (b. 1586) & Madeleine (b. 1588) became nuns;[75]
Cittérée Jeanne (1587-1635) = François de Chartres, sgr d'Arpaillant/Arpailhan (d. 1644)
>dgtr Marie de Chartres, O.D.N. (1640)

XIV. **Bernard de Montferrand-Landiras** (b. 1600), ***marquis*** de Landiras (Sept. 1651)
Succeeded to remaining properties & titles of the senior branch in 1660
= 19 Jan. 1647 **or** 21 Oct. 1646 ("Les Auschtzky de Bordeaux") Marie-Delphine (or Delphinette) de Pontac (1627-af. 1675)

XV.1. **Joseph-François de Montferrand, mrqs de Landiras & brn de Montferrand** (d. 1698),
Grand sénéchal de Guyenne et de Libourne (Communay has Jean-Joseph)
= unknown woman m.s.p.—or not?![76]

XV.2. **Léon de Montferrand, mrqs de Landiras & brn de Montferrand** (ca. 1659-6 May 1717)
premier baron de Guyenne, *grand-sénéchal* de Guyenne (declared hereditary on 21 April 1705)[77]
= Elizabeth de Rizaucourt (a daughter died young)
= 13 September 1700 Catherine de Meslon (1683-1724); mother of succession
Sisters: Marie-Catherine de Montferrand (1654-1731), O.D.N. (1720);
Louise de Montferrand (?)

XVI. **François-Armand V de Montferrand, mrqs de Landiras & brn de Montferrand**
(1704-18 August 1761), *grand-sénéchal* de Guyenne
= 1721 Thérèse-Jeanne du Hamel (d. 29 August 1761)
son: Charles-Hyacinthe (March 1730-2 October 1751); and
dgtr: Suzanne de Montferrand, O.D.N. (1745)
François-Armand's sisters: Henriette Catherine Olive de Montferrand, O.D.N. (1728);
Marie Catherine Lucie de Montferrand (b. 1707), O.D.N. (1731), ("GeneaNet");
Delphine de Montferrand (b. ca. 1702), *baronne* de Beychevelle[78]
mother of the succession
= 1720 Étienne-François de Brassier (ca. 1685-1744), sgr de La Marque

XV.1. **François Armand de Brassier, mrqs de Landiras & brn de Montferrand** (1723-1768)
= Mathive Jeanne Françoise Thérèse de Pommiers m.s.p.

XV.2. **Étienne de Brassier, mrqs de Landiras & brn de Montferrand** (1725-1787)[79]
(*célibataire*) m.s.p.

XV.3. **Delphine de Brassier, marquise de Landiras & baronne de Montferrand** (1722/25-1795)
= 23 June 1745 Michel-Joseph de La Roque, baron de Budos (ca. 1715-1770)

XVI. **François-Armand de La Roque-Budos, mrqs de Landiras & brn de Montferrand**
(ca. 1750-1825), *capitaine de dragons* et *chevalier de l'ordre de Saint-Louis*; *émigré*
= 14 April 1787 Catherine de Ménoire de Barbe (1765/66-1792)
Siblings: Charles François Armand de La Roque-Budos (b. 1762)[80] and
Marguerite de La Roque-Budos (d. 1820)[81] = 1775 Jean-Baptiste-Calixte de Montmorin (1727-1781), marquis de Saint-Hérem, *maréchal des camps et armées du roi*

XVII. **Catherine Delphine de La Roque-Budos, mrqse de Landiras & brnne de Montferrand** (1789-1860)
= 1814 Léon, baron de Brivazac (1774-1860) or b. 1776 (Bacque & O'Gilvy, 1856: I, 392);[82]
émigré (1798-1802), (O'Gilvy (1856: I, 392)

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[75]Marthe and Madeleine de Montferrand professed as *Religieuses Annunciades* in 1604 and then transferred to their mother's *Order/Company of [the Daughters of] Mary Our Lady*, in 1622 ("GeneaNet").

[76]One source gives them a son, François Joseph Lombard de Montferrand (1700-1770), *marchand* de Bordeaux, who in 1725 married Marie Labory, daughter of Pierre François Labory, *bourgeois* de Landiras. "Les Auschtzky de Bordeaux" (Génération 3; 1.2). If father Joseph-François really was the elder brother, why did the inheritance pass to his nephew? The same source has Joseph-François as the son of Bernard on his own *fiche* and as the son of Joseph François on the latter's *fiche*. These *fiches* also imply that Léon (dates, no titles) was the elder brother, yet Joseph François (no dates!) apparently bore all the Landiras titles at some point.

Communay also appears to acknowledge a son, Pierre François de Montferrand, *vicomte* de Foncaude (150, but not in his table).

Abbot, after creating doubts with his Pierre and two Gastons as sons of Jean IV (above), now has a "François IV" die after 1698 and then, after brother Léon, he offers François Armand (d. 1761) with a sister "Marie Brassier" (327).

[77]From here into the French Revolution every marquis de Landiras, baron de Montferrand is the *premier baron* de Guyenne and *grand-sénéchal* de Guyenne.

[78]A site so helpful concerning her parents and siblings aids yet further in calling this daughter Delphine de Montferrand, in contrast to the name of the nun Marie-Catherine suggested by others (Communay; "GeneaNet").

[79]Baurein writes (in 1784-86) that M. de Brassier "est le seigneur actuel", a statement that the "Nouvelle Edition" (1876) made no effort to update (III, 208).

[80]This Charles François Armand de La Roque and his widowed mother, Delphine de Brassier, sold much of the estate in 1793, during François Armand's absence. Some sources have "Charles" precede his elder brother's names, so it is difficult to distinguish them.

[81]Marguerite was Saint-Hérem's second wife. Anselme, IX (2), 956. The barony of Beychevelle passed to this daughter, after two generations associated with Landiras. Both mentions of her younger brother's duel only identify him as her brother (see the text at note 36 in Part Two).

[82]Féret (III, 100) confirms 1814 for the marriage. Bacque dates the marriage to 1801 (rather early, for the bride would have been twelve and the husband not yet back from England) and either offers no date of death or suggests 1821. But the 1821 date is offered by Bacque as if it were the death of the elder of two sons named "Léon". (A death before ten was not uncommon, followed by giving the same name to another.) The corrections and some additional information (here & below) is from Garrric (n.d.).

XVIII. **Léon II Armand de Brivazac** (1823-1889)
= 1860 Alice Louise Caroline de Lur-Saluces (1836-1901)[83]

Conclusion

Bare as these Genealogies have attempted to be, the discerning reader has already seen quite a variety of historical perspectives and experiences. The narratives earlier in this article and in the next flesh out the experienced histories of the Montferrand and Landiras dynasties. Whether genealogical "fact" or historical "interpretation", much remains in dispute or completely unknown, but our presentation of the diversity of opinion will contribute, we hope, to the resolution of some of the uncertainties.

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[83]Note the presence of a "de Lur" again. Cf. the *Maisons* d'Uza and de Cancon.

[84]How can this list be kept useful and grateful, without being cluttered or pretentious? The research attack, in addition to consulting solid reference books, was to Google most of the individuals mentioned here and then click on several of the offered links, for comparisons and comprehensiveness, then pursuing most relatives and even properties individually. Below, I shall list, to the fullest extent my recollection allows, the generic names of the sites to which I am indebted, but not always their internet coördinates. The latter are many and long, and often the only word changed is the name of the person concerned. So, my conclusion, dear readers, is to advise you to Google directly whoever interests you by his or her name, but to remain open, creative and persistent in your search.

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Borderland Theory as a Conceptual Framework for Comparative Local US and Canadian History

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My book *From Great Wilderness to Seaway Towns*: *A Comparative History of Cornwall, Ontario and Massena, New York, 1784-2001* compared the two towns at different historical moments from 1784 to 2001 by utilizing Oscar Martinez's borderland theory and argued that the shared experiences of Cornwall and Massena's residents based on their borderland locations lead them to follow comparable patterns of social and economic development. As former American colonists, both area residents wanted to develop towns identical to their former communities. The founders of Cornwall and Massena and their descendants, therefore, challenged national values and beliefs and developed a distinctive society and culture of their own. In contrast to Seymour Lipset who argued that the organizing principles made the two countries different, my research suggests that Louis Hartz was closer to the mark when he stated "the differences between the two countries are less significant than the traits common to both." To determine the how the lives of Massena and Cornwall residents' lives were affected by their border locations, I highlighted key events and experiences that caused these men and women to develop common values and beliefs and adhered to the methodology of local historians.

Keywords: Canada; US Local

When I began researching the history of Massena, New York and Cornwall, Ontario in 1996 as a possible dissertation topic, I searched not only for historical documents, but also a methodology and theoretical framework to analyze the economic, political, and social values of these two border towns. The only literature that existed at that time either concerned the lives of residents on the US/Mexican border or the contrasting national values of the United States and Canada. I, therefore, like many local historians, came up with my own model and approach to evaluate the history of Massena and Cornwall. In "A Manifesto: The Defense and Illustration of Local History," Paul Leuilliot stated, "Sometimes for lack of a model, the local historian must invent a method of approach… For local history this method may differ from the method appropriate for general history—for the simple reason that a history of a sector must develop its own original hypothesis for discovery and inquiry" (Leuillot, 1977: p. 14). By using Oscar Martinez's borderlands milieu theory and local history techniques as a methodological and research framework, I compiled my own interpretation of the relationship and differences between the residents of these two border towns.

Canadian and American scholars' research comparing and contrasting the values, experiences, and beliefs of residents of these two nations has tended to reflect two broad schools of thought. Seymour Lipset laid the groundwork for the first hypothesis, known as the value-orientation theory in his 1963 paper, "The Value Patterns of Democracy: A Case Study in Comparative View." Recently, in *Continental Divide*: *The Values and Institutions of the United States and Canada*, he surmised his 30-year sociological analysis of the cultural and institutional differences between Canada and the United States. Lipset made specific assertions about how the establishment of businesses, personal relationships, governments, and churches by Canadians and Americans reflected their opposing economic, social, and religious values. Since the American Revolution, all sectors of Canadian and American society have diverged because of the countries' contrasting organizing principles. Canadians are more class aware, law-abiding, elitist, and collectively oriented, while Americans pride themselves on living in an egalitarian, classless society, and thrive on individualism and personal achievement. Even with the increasing melding of the economies and popular culture of Canada and the United States since World War II, fundamental developmental differences guarantee that the two nations will never be economically, socially, or politically identical (Lipset, 1990: pp. 120-122).

Many scholars questioned the relevance of Lipset's value-orientation approach in explaining cultural changes in the United States and Canada after World War II. In 1973 Irving Horowitz challenged the contemporary merits of Lipset's theory based on the growing economic and cultural similarities between the United States and Canada. In his essay, "The Hemispheric Connection: A Critique and Corrective to the Entrepreneurial Thesis of Development with Special Emphasis on the Canadian Case," he argued that the behavioral and value differences between the United States and Canada were not historically linked to the nations' conflicting revolutionary ide-

ologies, as Lipset suggested, but were instead based on a lag between the two countries' social development. Once Canada completed its social and economic evolution, Horowitz stated, the country would become more like the United States and less like Great Britain. This transformation began following World War II, as the increasing level of crime, education, and religious participation in Canada narrowed the cultural gap between the United States and Canada. Horowitz, therefore, concluded that "Lipset's thinking is premised on a continuation of pre-World War II tendencies rather than post World War II trends" (Horowitz, 1973: p. 346).

In the last fifteen years, numerous books have surfaced in which scholars compare the United States and Canada on a national level. Firstly, *Fire and Ice*: *The United States, Canada, and the Myth of Converging Values*' author Michael Adams pointed out how Canadians and Americans are not getting more like each other, but instead are diverging in many important ways. Jason Kaufman who penned *The Origins of Canadian and American Political Differences* critiqued the public and political policy of the United States and Canada from colonialism to the present day by framing his argument around five specific differences between American and Canadian development: economic; collectivism, social services, and voter alignment; comparative federalism; individual and civil rights; and identity politics. Finally, David M. Thomas and Barbara Boyle Torrey's five-section edited collection *Canada and The United States*: *Differences that Count* allowed various authors to comment on the values, politics, beliefs, and social policies of each nations' leaders and citizens.

A second group of scholars offered a glimpse into the lives of border residents in the American and Canadian Pacific region. Led by Wallace Stegner's *Wolf Willow*, a poignant reflection of growing up on the Montana/Saskatchewan border at the turn of the twentieth century, researchers in this new vein analyzed various aspects of life in borderland regions. Sterling Evans divided his contributors' essays, *The Borderlands of the American and Canadian Wests*: *Essays on Regional History of the Forty-Ninth Parallel*, into five sections addressing regional definition, colonization of borderlands, agricultural economies and labor markets, and environmental issues. While both groups of comparative historians studied local and regional experiences, a void still exists in terms of the lives of residents in the North American Atlantic border region over an extended period of time.

In *Border People*: *Life and Society in the US-Mexico Borderlands*, Oscar Martinez outlined a set of criteria to evaluate the uniqueness of border town life and used oral interviews to prove his theory. His most useful tool for US and Canadian historians was his argument that inhabitants of border towns function in an environment called the "borderlands milieu". These circumstances are defined as "unique forces, processes, and characteristics that set borderlands apart from interior zones" (Martinez, 1994: p. 10). According to Martinez, residents of border towns face the constant threat of foreign invasion, deal with heterogeneous populations, interact with foreigners, and feel separated or isolated from their countrymen.

Martinez also offered three models of borderland's interaction: alienated, coexistent, interdependent, and integrated. He ascertained that the settlers of interdependent borderlands experience circumstances making their lives stand out from the national norm. Borderlanders witness a flow of money and people that created opportunity to establish social relationships across the border. This fluid relationship also fostered fear among men and women of outsiders because of their continued exposure to people of varying ethnic background. Due to their remote location, farmers, shopkeepers, and religious leaders acquired a sense of otherness and thought of themselves as different from people in interior regions. In the case of US/Canadian border, according to Martinez, several Hollywood films portrayed the border as a place that offered escape, a second chance, an opportunity to forget, and safety and comfort for those in need. Politically, town leaders have often seen laws as being made by distant, insensitive, and excessively nationalistic politicians. The sparse number of residents and voters and remoteness from centers of power limit their political clout often resulted in the proposals of their leaders for social and economic improvements being frequently ignored by decision makers. Finally, borderlanders differed from residents of their national heartland because of their exposure to foreign economies, increased employment opportunities, and consumer choices unavailable to those in heartland (Martinez, 1994: pp. 23 & 25).

My book *From Great Wilderness to Seaway Towns*: *A Comparative History of Cornwall, Ontario and Massena, New York, 1784-2001* compared the two towns at different historical moments from 1784 to 2001 by utilizing Oscar Martinez's borderland theory and argued that the shared experiences of Cornwall and Massena's residents based on their borderland locations lead them to follow comparable patterns of social and economic development. As former American colonists, both area residents wanted to develop towns identical to their former communities. The founders of Cornwall and Massena and their descendants, therefore, challenged national values and beliefs and developed a distinctive society and culture of their own. In contrast to Seymour Lipset who argued that the organizing principles made the two countries different, my research suggested that Louis Hartz was closer to the mark when he stated "the differences between the two countries are less significant than the traits common to both" (Hartz, 1964: pp. 1-48).

To determine how their border locations affected the lives of Massena and Cornwall residents' lives, I highlighted key events and experiences that caused these men and women to develop common values and beliefs and adhered to the methodology of local historians. In "A Manifesto: The Defense and Illustration of Local History" by Paul Leuilliot, he described the different techniques and elements of doing local history and chronicling the lives of common people. Firstly all of the research methods utilized by local historians are more flexible, more qualitative then quantitative, and many times experimental. Also, the researchers in this realm concern themselves with the invisible aspects of daily life impacting peoples' values and beliefs including age-old traditions and folklore. Local history overflows into the history of mentalities, of attitudes toward life, death, money, and innovation. Unlike most historians, whose work centers on colossal events and actions of leaders on a national scale, I specifically exposed the differences in terms of values, development, and social and economic experiences of borderland residents in juxtaposition with their countrymen in other regions. As Leuilliot concluded, my concerns and methodology differed from academic and national historians and included both primary and secondary sources. I exposed the differences between national and local values and experiences and showed why the heartland of the United States and Canada is different from the borderland (Leuillot, 1977: pp. 6-26).

In 2009, my book entitled *The St. Lawrence Seaway and Power Project*: *An Oral History of the Greatest Construction Show on Earth* expanded my analysis of the interplay between Cornwall and Massena residents with outsiders, the regional interdependence in terms of trade and social relationships, and the limited political clout of local leaders in terms of lobbying state and local officials for funding for social and infrastructure programs. As Martinez asserted, certain border regions experience a greater flow of economic and human resources across the border, greater trade and consumerism, and a sense of otherness from those in the interior sections that triggers fear of outsiders and a political inferiority complex. However, the lack of long-term social and economic impact of the St. Lawrence Seaway project on the area contradicted Martinez's argument that borderland areas thrived after World War II both socially and economically. Instead my research supported Paul Leuilliot's assertion that local areas serve as indicators of future national trends. Both Cornwall and Massena residents witnessed deindustrialization and a loss of population due to the movement of manufacturers south in search of cheaper labor and operating costs.

The Settlement of Cornwall and Massena

Cornwall, Ontario and Massena, New York are two towns separated by a narrow expanse of the St. Lawrence River on the northern New York/Canadian border. Besides being close geographical neighbors, settlers arrived in each locale in the closing decades of the eighteenth century. In 1784 no longer welcome in the former colonies United Empire Loyalists and their families relocated to Royal Township #2, later renamed Cornwall. Northeastern farmers migrated to Massena leaving family homesteads in New England and New York in search of cheap and abundant land on the newly opened frontier. As Martinez suggested, both area's founding families saw their new homes as places that offered a second chance and an opportunity to forget. Initially, both groups of settlers struggled to become economically self-sufficient and foster cultural and political institutions among a widespread and often transient population. Settlers' shared spiritual beliefs gave them the strength to endure the harsh frontier conditions and enhanced their relationships with their neighbors.

Cornwall and Massena's isolated borderland location encouraged these men and women to adopt contrasting religious values and beliefs to those in other regions of the United States and Canada. During the frontier days, in the absence of ministers, Cornwall and Massena inhabitants took charge of their spiritual lives by organizing congregations and recruiting new worshipers as a way to create social bonds between members of scattered and often transient populations. Many worshippers saw their faith as a way to deal with the harsh conditions and isolation of frontier living. Like the pioneers who settled the American West, the loyalists experienced starvation, financial uncertainty, and loneliness.

While many of the loyalists and their families practiced the more structured faiths of Presbyterianism, Anglicanism, and Roman Catholicism, recruiting full-time ministers and priests, proved difficult as many members of the British clergy viewed Canada as an unsettled frontier and its parishes as an undesirable assignment. Therefore, settlers started their own congregations and conducted their own services without the guidance of a minister. Lay readers not only presided over sporadic services, but also performed weddings and funerals. The Presbyterians, the most prominent faith in the area from the early days of settlement and traditionally one of the most nationally organized religions, altered the deference of local worshippers to the authority of church leaders as it had in the former American colonies. While Cornwall Presbyterians still accepted the Book of Common Prayer and stressed ceremony and Christian discipline, parishioners retained their ability to excommunicate members and to ordain their own minister. In 1839, 961 residents attended services at St. John's Presbyterian Church (Upper Canada Return of Population and Assessment, Volume 1: p. 574).

Methodism appealed to many Cornwall residents based on its simple doctrines and organization and its evangelical traveling preachers. John Wesley, the faith's creator, stressed the role of the individual in seeking salvation and preached that perfection was available to those who desired it with the aid of the Holy Spirit. While a superintendent oversaw and defined the circuits that traveling preachers serviced, it was the weekly class meetings that were the foundation of Methodism. Occasional camp meetings, held by two or more ministers, also served as a source of group consciousness based on shared spiritual values. These planned gatherings made settlers feel less isolated and part of a community. Ministers preached about the central values and motivation of settlers' including self-sufficiency, social equality, and individualism. The conversion experience itself provided worshippers with a release from the anxiety and frustration associated with frontier life. By 1839, the number of Cornwall Methodists had risen to 160 (Upper Canada Return of Population and Assessment, Volume 1: p. 574).

The religious experience of Massena residents mirrored that of their Cornwall neighbors as they too organized congregational and voluntary associations. Between 1800 and 1840 Massena Congregationalists and Methodists met weekly for prayer services as traveling preachers only periodically visited. These loosely organized congregations served as the town's central social and cultural organizations. Congregationalists also periodically reaffirmed and strengthened their spirituality by observing days of fasting and humiliation and attending weekly prayer meetings. This faith offered Massena settlers some regularity in their lives, while still appealing to their desires to have a personal relationship with God. During early settlement, the Methodists were the only challengers for the souls of the Massena faithful. Beginning in 1805, circuit riders charged with preaching to worshippers in Malone, Ogdensburg, Potsdam, and Massena infrequently conducted services in private homes and schoolhouses (Prince, 1961: p. 1). Most riders successfully gained new followers because, unlike their Protestant counterparts, they ventured into the backwoods areas and preached to members of the rural community.

Political Organization

Politically, the founding fathers of Cornwall saw the laws and structures that distant leaders requested they implement as insensitive and nationally oriented. Regardless of the fact that the loyalists and Massena residents now lived on opposite sides of the border, both still harbored comparable political goals and values. These former soldiers and prominent farmers did not desire a strong paternalistic government and did not defer to authority. Cornwall residents, unlike their counterparts in the neighboring towns of Alexandria and Kingston, never developed hierarchical political structures. Instead, Cornwall settlers,

similar to Massena residents, demanded a democratic, popularly elected government. Loyalists attempted to establish the same participatory government structure they had in their former home towns. Residents wanted town meetings and local courts administered by officials who concerned themselves solely with the financial and legal administration of the towns, and who did not interfere with individuals' rights. While Cornwall loyalists initially failed in their efforts to gain a democratic local government, their protests exhibited their desire for the same political system that their American neighbors implemented after the Revolution. Like other frontiersmen, they insisted on a degree of political autonomy which set them apart from other Canadians and angered provincial government officials.

The attempt to establish an organized governing structure in Cornwall exposed the differing political beliefs of the former military commanders and common citizens. National government officials first attempted to formalize the structure of town government by ordering settlers of the royal townships to hold town meetings in 1787. In Cornwall a conflict arose between former military leaders, and local activists, over who should conduct the meetings and be eligible for election as town delegates. When the gathering was held on July 12, 1787, local activists led by Patrick McNiff forced Samuel Anderson, the current town magistrate and a group of fellow officers to leave the proceedings by threatening their lives. The citizens who remained at the meeting elected 10 representatives, including McNiff. However, Anderson and the other regiment commanders challenged the election. In response to the controversy, dominion officials set aside the idea of locally appointed officials administering town affairs, and instead created a regional and national political structure that controlled town affairs from above (Senior, 1983: p. 62, Report of Ten Inhabitants…, and Ensign Francis McCarty Deposition).

Massena residents established a democratic government from the town's inception. In 1802 the New York State Legislature passed the original county charter empowering the residents of Massena to establish locally based legal and political structures. Judges of the court of common pleas and circuit court decided criminal and civil complaints, while town meetings administered by elected officials authorized the construction of roads, allotted funds for the poor, and dealt with other miscellaneous town matters. Early town officials included a supervisor, town clerk, assessor, overseer of the poor, commissioner of highways, and superintendent of schools. The first town meeting took place in Massena in 1803 at the home of Peter Tarbell. The locally elected Massena government concentrated on completing road projects and developing a social welfare system (Podgurski, Prince, & Peers, 1959: p. 5).

The Canal Era

For much of the nineteenth century, Massena and Cornwall politicians found their demands ignored by state and national officials concerning the development of waterpower along the St. Lawrence River, and therefore, took matters into their own hands. A debate raged over the practicality of constructing a canal for the purpose of converting the energy produced by the current of the St. Lawrence River into electricity for public and private use. Local citizens and politicians realized the economic opportunity offered by channeling this natural resource, but could not convince state officials of the validity of their proposal or garner the necessary private monies to bankroll the construction.

The members of the Upper Canada Parliament initially discussed the Cornwall canal project in 1816 because of the difficulties military commanders encountered transporting their troops and supplies up and down the St. Lawrence River during the War of 1812. In 1818 members of a provincially appointed commission studied the specific geographic and economic aspects of such an undertaking. Following lengthy parliamentary debates about the waterway's merit and substantial price tag, national officials authorized the Cornwall Canal project on February 13, 1833. A decade later, contractors completed the original 11 1/2-mile-long canal. Constructed between 1834 and 1843, the Cornwall Canal, the third in a series of nationally funded projects built along the St. Lawrence River between Montreal and Cornwall, improved inland water transport and expanded the country's hydro-generated power. However, soon after the conclusion of the project, the Canadian government's transportation minister realized that the water depth and width of the locks could not adequately accommodate the ships of the age and improvements continued for several decades (Pringle, 1934: p. 3; The Chronological History…, 1934: p. 1).

The first political defeat in the US came in 1833 when local Massena officials presented a petition to the New York State Legislature that described the power canal and its potential financial attributes. While the proposition peaked the interest of enough of the members to warrant a feasibility survey, the enormous expense of the undertaking, including the purchase of large amounts of privately owned land, the employment of large numbers of workers, costly machinery and materials, compounded with the lack of industries to purchase the power, caused the proposal to be tabled until 1897. Learning from past mistakes, Henry Warren, a local real estate magnate, garnered an impressive list of five foreign investors committed to funding the multi-million dollar construction and acquired the property rights to the necessary land, prior to making a presentation to the legislature. Among the original investors was Albon Man, a long-time annual visitor to Massena Springs, who wished to give something back to the community that had furnished him with so many memorable vacations over the years. With Man's help, Warren enlisted the financial backing of three of his friends, M. H. Flaherty, C. A. Kellogg and Charles Higgins—a situation that left the men in Albany with little choice but to approve the measure (Podgurski, Prince, & Peers, 1959: p. 7). Upon the project's completion, it had silenced its critics by convincing the Pittsburgh Reduction Company to build a plant in Massena and lease power from the newly formed St. Lawrence River Power Company.

The Arrival of Foreigners

Cornwall and Massena's locations near the canals forced residents to deal with foreigners sooner than their immediate neighbors. The Board of Works and private contractors employed more than 1000 Irish laborers on the Cornwall Canal between 1834 and 1842. Most laborers lived in shanty huts near the canal site and shopped at the company store. Poor living conditions and high unemployment rates led to violence. Historian J. F. Pringle notes, "Hundreds of men were employed on the various contracts and it was only natural that there should be a rough element that were constantly making trouble" (Pringle, 1934: p. 3; The Cornwall Canal, 1887: p. 1). Local inhabi-

tants distrusted the Irish canal workers and expected them to abide by the law and adopt Canadian religious and social values. As Oscar Martinez indicates, "In the case of isolated villages, discord with other groups may arise out of fear and resentment triggered by encroachment from outsiders" (Martinez, 1994: p. 17).

When canal workers murdered deputy sheriff Ewen Stuart in 1834 and former lieutenant governor Albert French two years later, animosity arose between the Irish laborers and long-time Cornwall inhabitants, and exposed the latter's fear and lack of tolerance for immigrants. After canal workers repeatedly committed violent crimes, many residents considered the roads bordering the canal unsafe for travel and took alternate routes. In September 1835, Cornwall magistrates applied to Lieutenant Governor John Colbourne for military assistance in maintaining order and public safety until the project's completion. According to a *Cornwall Observer* editor, "After this sacrifice of one of our most respected townsmen, Sir John Colbourne cannot refuse two companies at least to guard our jail and maintain our laws" (Editorial, 1834: p. 1). In 1836, the troops arrived and remained stationed in Cornwall until 1843.

Lehigh Construction managers promised Massena town officials at the inception of construction in 1897 that the canal workers and their families brought to Massena to work on the waterway project would not negatively affect the surrounding community. As company officials strove to be self-sufficient in terms of housing and supplies, they constructed Camp Bogart on the north side of town consisting of a dining hall, kitchen, and several 20 by 50 feet buildings, each housing up to three workers and their families. As the project progressed, there was not enough room at Camp Bogart for the increasing number of workers, and many were forced to live in shacks or sand dugouts made of old boxes and lumber near the canal site. The cluster of primitive buildings, referred to as White City, was located on North Main Street, and extended from the town border to the canal site. According to local journalist, Anthony Romeo, "Life during the canal days was appalling. The Italian and Hungarian workers and their families spent subzero winter nights in tarpaper shacks with no running water" (Romeo, 1961: p. 2).

Town residents became increasingly worried about the surge in crimes committed by canal workers, much of which was reported in the local newspaper. Canal workers not only got into frequent skirmishes with each other, but also with the St. Regis Indians. This behavior reinforced Massena residents' aversion to foreigners. The Massena police chief did not hire additional constables as most job foremen preferred to personally deal with the indiscretions of their workers. However, several incidents described in the *Massena Observer* required the assistance of law enforcement personnel. Even though these violent acts were not directed at members of the general public as they had been in Cornwall, they aroused a great deal of fear and concern for public safety.

From Agriculture to Industry

Contrary to Martinez's argument that the isolation of border towns resulted in their economic underdevelopment and neglect prior to World War II, following the construction of power canals on the St. Lawrence and Grasse Rivers, Cornwall and Massena became major regional manufacturing centers. Wealthy Montreal entrepreneurs financed Cornwall's initial factories. More than a dozen manufacturing operations, including a paper mill and a men's clothing factory, joined these enterprises by the early twentieth century. Massena's first major manufacturing firm was an aluminum processing plant constructed by the Pittsburgh Reduction Company in 1903, later known as the Aluminum Company of America (Alcoa). The workers recruited by the owners of these large enterprises altered the population of Cornwall and Massena and increased the number of local residents employed in manufacturing.

In the second half of the nineteenth century, Cornwall's economy shifted away from agriculture to manufacturing as Canadian entrepreneurs gravitated toward favorable locations for factories near canals and dams. Manufacturers recognized the St. Lawrence canals as accessible transport routes for their raw materials and the accompanying dams as sources to power their waterwheels and produce electricity. Municipal bonussing program implemented by town officials additionally provided mill owners with start-up cash, tax incentives, and emergency loans. Andrew Hodge, a former mill operator and current town councilor, stated, "This municipal council duly recognizing the importance of manufacturing in this country… pledges to aid and assist all cotton, woolen and other similar factories which may be established within the municipality" (Senior, 1983: p. 227).

George Stephen became the first to set up a factory incorporated as the Cornwall Manufacturing Corporation along the Cornwall Canal in 1867. His primary investor, Sir Hugh Allan, served as a silent partner and Stephen served as vice president. The factory's looms driven by waterwheels allowed workers to produce Canadian tweed blankets and flannels for a national and international market. The facility included a dye house, storehouse, and tenant cottages for workers in addition to the main mill building. By 1887 Stephen employed 750 workers with an average monthly payroll of $18,000 (Parham, 2004: p. 35).

Following the success of Stephen's mill, Andrew and Robert Gault, Bennett Rosamond, a partner of Stephen's in Mississippi, Montreal businessmen Edward MacKay and Donald Smith, and Cornwall mill owner John Harvey, financed two other cotton plants. Similar to Stephen, the workers in each facility produced woolen goods for Montreal merchants to sell wholesale and retail. Each of the manufacturers solicited incentives and long-term tax exemptions from local officials. In 1903 the three mills' owners jointly employed 1463 workers, produced goods valued at $1,647,347, and paid $446,588 in wages (Senior, 1983: p. 233; Pringle, 1980: p. 294; Parham, 2004: p. 37).

John Barber and a group of Toronto investors also located a major paper mill in Cornwall because of the area's ample water-borne power. The Cornwall canal provided Barber with waterpower for his machinery and paper processing. The waterway also offered him a direct transportation route for his raw materials from northern Ontario and for his finished product to various ports, including Montreal. In 1882 Barber completed construction of a $141,674, 33-acre facility on the north end of the Cornwall canal. He also purchased $126,397 of the latest water-powered machinery and hired 100 employees. Surprisingly, Barber received no bonuses or incentives from the town. The operation of his paper machines around the clock on every day but Sunday reflected the success of his new operation (Pringle, 1980: p. 295; Harkness, 1946: p. 236; Senior, 1983: p. 234).

The most important social effect of industrialization on Cornwall was an increase and diversification of the population.

From 1870 to 1891 many French Canadians from surrounding towns and impoverished British subjects from overseas came to Montreal in search of employment. Unlike many areas of Canada during these decades where town officials battled a recession, Cornwall leaders welcomed three new mills, whose employment needs exceeded the local supply. With the poor conditions in the surrounding rural areas, French Canadians moved into town to fill these new factory jobs. By the turn of the century, 1105 individuals had immigrated to Cornwall, with 466 new residents arriving between 1881 and 1890. The town's total population increased from 5081 in 1871 to 6790 in 1891 (Census of Canada, 1871: Table 4, p. 274; Census of Canada, 1901: Table 17, p. 459; Census of Canada, 1941: Table 10, p. 113). As French Canadians spoke a different language from existing residents, they relied on each other for financial and spiritual support and security. In Cornwall the Quebecois became active members in the Catholic Church as a means of dealing with their new unfamiliar surroundings.

The abundance of inexpensive power created by the Massena canal caught the attention of the nation's largest aluminum processing company—Pittsburgh Reduction Company—later known as the Aluminum Company of America (Alcoa). Founded in Pittsburgh, Pennsylvania in 1888 under the watchful eye of Charles Martin Hall, the inventor of a low cost way of producing aluminum, and with the financial backing of a group of young entrepreneurs headed by Alfred Hunt, the company monopolized the national market within a few short years. For almost a decade, the Pittsburgh Reduction Company resisted expansion and concentrated on improving its Pittsburgh operation. But, the constant protesting of workers and the astronomical price of electricity encouraged the company to seek alternate manufacturing sites with more favorable conditions, first in Niagara Falls in 1895 and seven years later in Massena near the new power canal. The locale presented the company with two long sought luxuries—affordable electricity and a docile labor supply (Carr, 1952: p. 2).

Following a May 15, 1902 visit to Massena by company executives Arthur Davis, Charles Hall, and E. S. Fickes, Pittsburgh Reduction purchased 100 acres of land east of the canal. Two months later contractors began construction of a $1 million facility that included five 550-feet long production buildings, a storage yard, and company-owned railroad tracks. Alcoa officials also purchased the entire annual output of the newly finished powerhouse from the owners of the St. Lawrence Power Company. Davis, Hall, and Fickes expected their new Massena factory to eventually become Pittsburgh Reduction's main processing plant. At the inception of production on August 24, 1903, Pittsburgh Reduction's Massena managers hired 67 men to manufacture aluminum wire, cable, and cooking utensils (Massena Alcoan…, 1952: p. 7).

Within three years, company executives approved the construction of a new reduction facility and enlarged the original wire department, thereby doubling the factory's production capacity and increasing the number of workers to 581. Alcoa employees also deepened the Massena Canal, updated the generators and turbines in the powerhouse, and constructed another pot room, rolling mill, and a larger wire mill. By 1910, company managers employed 171 men and boys in the reduction division, 59 in the carbon plant, 140 in the fabricating plant, and 269 in the power division (Internal Alcoa Document).

The success of Alcoa encouraged the establishment of other manufacturing companies including a silk mill, insulating company, a macaroni factory, and a lingerie factory. These businesses provided jobs for the wives and daughters of aluminum workers and local female residents who wanted to supplement their family's income. Also the construction of Diamond Creamery in 1907, a cooperative producer of condensed milk financed by farmers and local investors, served as another source of employment outside of farming and aluminum production.

Massena's population and social life changed with the influx of foreigners to work at Alcoa. The town's population quadrupled and diversified with the arrival of European immigrants. These immigrants initially consisted of Italians and Jews from New York City, and later of recent arrivals from Eastern Europe, Central America, and Scandinavia who adhered to different cultures and religious traditions that taxed the patience of local residents and stressed the available housing market. The transformation that took place in the first half of the twentieth century pressured this small town to come to terms with its new identity as an industrial center and with the difficulties of dealing with a diverse population.

To combat local residents' uneasiness, Pittsburgh Reduction officials constructed separate housing for workers and managers in previously undeveloped areas of town. Throughout the next several decades, Alcoa officials also enrolled their immigrant workers in company-sponsored Americanization programs, in which instructors taught new families the English language and the basic elements of American history. On a municipal level town councilors approved funding for a larger police force and the construction of more schools to accommodate the increasing number of school-age children. However, the implementation of these initiatives did not erase the intolerance community members held for outsiders and their unfamiliar customs.

In addition to dictating where its workers' resided, Alcoa controlled other aspects of their lives as a preventative measure to guard against complaints about unruly behavior outside the factory walls. Doctors treated injured workers and the ailments of their immediate family in an on-site hospital in order to dispel the idea that immigrants had poor hygiene, lacked respect for medical care, and therefore, contributed to the ill health of the community and burdened local health care facilities. Company officials also organized bowling leagues and created a local baseball team that played matches against neighboring towns. Both measures gave members of the community and Alcoa workers a common social experience with the hopes of improving the tenuous personal relations. However, company executives underestimated the power of the long history of local biases and dislike for outsiders that dated back to the early encounters with the St. Regis Indians. It would take more than fancy housing and sports teams to overcome these heartfelt feelings.

A local reporter provided the first documented example of the misconceptions Massena residents harbored about immigrants in his account of a visit to 600 illegal Chinese immigrants detained at the county jail in 1901. Under the title, "Hundreds of Chinese: Yellow Tide Still Streams," the writer told of the deplorable conditions in the jail where the Chinese men were housed and described it as the "black hole of Calcutta", an obvious reference to the perception of the poor living conditions in India. He continued by expressing amazement at the jovial attitudes of the inmates and assumed that this behavior was based on the conditions at the jail being more favorable then those left behind in their homeland. In the remainder of his

commentary, the writer repeatedly exhibited his ignorance of foreign cultures and his support of the popular opinion that Asians were naturally weak and childlike. The most memorable portion of the article detailed the attempts by local boys to teach the Chinese how to play American football. Throughout this example, the author compared the awkwardness of the physical movement of the Chinese in comparison to the skillfulness of the young Americans highlighting his narrowmindedness and intolerance for foreign cultures (Hundreds of Chinese…, 1901: p. 6).

The Seaway Politicians

Politically both towns' leaders continued to be ignored in the twentieth century by state lawmakers in their quest to improve their regional economies and future prospects with the construction of the St. Lawrence Seaway and Power project. Based on the remoteness of the area and the sparse number of voters, in order for their voices to be heard, their campaigns lasted decades and finally achieved their goals when national security matters added a global component to their demands. Without the effort of these individuals, the Seaway would have slipped off the national radar without being constructed. Most Cornwall and Massena politicians believed the future economic survival of the region hinged on the completion of the St. Lawrence Seaway project. Aaron Horovitz, Lionel Chevrier, Thomas Bushnell, and Dr. Rollin Newton all recognized the potential of the cheap water power and transportation for attracting new businesses. They spent their lives pressing for the passage of Seaway legislation by Canadian and US national officials. Without the perseverance of these men, the project never would have come to fruition.

Aaron Horovitz was the most influential and longest serving twentieth century Cornwall politician. Horovitz, a native of Romania, established the Prince Clothing Company along with his brother Louis in 1911. In 1930 Horovitz became the mayor of Cornwall and the first Jewish leader of a Canadian town. Between 1930 and 1956 Horovitz occupied the mayor's office for 18 years, the longest tenure in Cornwall history. His expertise as a business owner helped him settle the labor disputes and worker housing problems of the 1930s, handle the earthquake devastation of 1944, and convinced him of the importance of the Seaway project for the survival of current manufacturers and the future economic development of Cornwall (Horovitz to Seek Reelection, 1956: p. 2).

Horovitz spent his final years as an elected official promoting the economic benefits of the St. Lawrence Seaway project to local business leaders and politicians. In a speech to the Cornwall Board of Trade in May 1954, he described how the completion of the power and transport elements of the Seaway would boost the local economy and job market. Horovitz emphasized the reluctance of many business owners to locate plants in Cornwall without the passage of national legislation to fund the Seaway. He indicated that many company executives had decided to construct operations in other towns due to cheaper electricity and transportation. A positive outcome for ongoing negotiations depended upon the Seaway project approval. The completion of the waterway would cause manufacturers to flock to Cornwall and provide long-term employment for area residents. Horovitz ended his speech by stating "we are close to a transition period in Cornwall, and planning for the future is essential" (Horovitz, 1954).

Lionel Chevrier earned the title as one of the most well-known national leaders from Cornwall in the twentieth century. He was hailed by the press and the people of Cornwall in the 1950s as "Mr. Seaway" due to his efforts from 1930 to 1953 to convince Canadian and American officials to pass the St. Lawrence Seaway legislation. Chevrier was born in Cornwall in 1903, the son of Joseph Chevrier and the former Melvina De-Repentigny, both French Canadian Catholics. His parents came to Cornwall on their honeymoon and moved to the area in 1890 because of the promising business opportunities. By the time Lionel was born, his father, Joseph, owned a thriving grocery business and later became a Centre Ward councilor and Cornwall's first French Canadian mayor (Good, 1987: p. 15).

Chevrier followed in his father's footsteps in terms of politics and inherited his father's dream of constructing the Seaway. Lionel attended the Centre Ward Separate School and the Cornwall Collegiate Institute before enrolling at the University of Ottawa in 1917. Following graduation he attended a seminary for a year and then went to law school at Osgoode Hall. Lionel was admitted to the bar in 1928 and set up a practice with George Stiles, a well-known Cornwall lawyer, and Howard Hessell, a former classmate. Upon his return to his native town, he became a member of the Board of Trade and was appointed secretary of that organization from 1931 to 1934. In that position he prepared and presented an in-depth study regarding all the ramifications and possible local effects of the proposed St. Lawrence Seaway project. A summary of the information Chevrier uncovered was released to the public and he made numerous speeches to civic organizations. His report put the Seaway back on the national political agenda in the US and Canada. According to biographer Mabel Tinkiss Good, this research project on the Seaway and his connection with the board brought Chevrier into the national spotlight and led him into an unplanned political career. When the liberal party leadership sought a spirited and well-spoken political candidate for one of Ontario's parliamentary seats in 1935, Chevrier fit the bill (Good, 1987: p. 51).

In 1935 Chevrier won a seat in Parliament for the Liberal party. He began a three-decade-long undefeated political career highlighted by his constant efforts to promote the Seaway. In May 1943 Chevrier was appointed assistant to the Minister of Munitions and Supply, C. D. Howe, in the MacKenzie King government. Two years later, King appointed him Minister of Transport offering him the perfect opportunity to promote the Seaway project at home and abroad. By January 1953, Chevrier and other leaders, including Prime Minister Laurent recognized that American interest in the waterway and power project had dwindled and determined that Canadian contractors should complete the project exclusively on the Canadian side. Months later, President Harry S. Truman and the US Congress passed the Wiley-Dondero bill and the project was undertaken jointly. In 1954 Chevrier assumed the post of president of the St. Lawrence Seaway Authority, a position he held for three years (Good, 1987: pp. 53-56).

During the Great Depression and times of global conflict, the leaders of Massena also kept the vision of the Seaway alive as state and national leaders paid more attention to social programs and the war effort. All of the leaders of Massena prior to the construction of the St. Lawrence Seaway spoke of the project as the key to the area's future economic success. Their lifelong commitment, public campaigning, lettering writing, and speech making led national leaders to approve the St. Lawrence

Seaway bill.

Thomas Bushnell had a long local political career, but his dedication to the Seaway project caught the eye of state officials almost garnering him a coveted trustee position in the newly formed New York State Power Authority in 1943. He was born in 1889 in Palmyra, New York, a town between Rochester and Syracuse, the son of a Civil War veteran.

Bushnell lost his first mayoral race to W. Gilbert Hawes by three votes in 1929. Bushnell defeated Hawes two years later by a margin of 1312 to 1037. In 1933 Bushnell was challenged by Ira Dishaw, but won the contest 1364 to 1062. Two years earlier he was considered by local Democrats and Republicans as a strong contender for one of the trustee positions with the New York State Power Authority. Although he was not appointed to the board by Governor William Harriman, Bushnell remained a strong proponent of the Seaway and for a time became the project's unofficial spokesmen. As mayor he had traveled with other area politicians and business leaders to the Hotel Franklin in Malone to encourage Warren Thayer, a state senator from Chateaugay, to cast his vote in favor of the Power Authority bill. Bushnell also presented a speech at a meeting of the Great Lakes Association in Toronto in 1934 in which he expressed support for the Seaway project and its benefits for Massena. The following year he lost the mayoral race to Dr. Rollin Newton (Prince, 1967: p. 5).

Dr. Rollin Newton was the most important leader in Massena in first half of twentieth century. He was a major supporter of the Seaway project, a champion of infrastructure improvements, including better roads and sewers, and the benefactor of the town's first hospital. Newton was born in Stockholm, New York in 1872. He attended Brasher and Stockholm High School and graduated from Potsdam Normal School in 1896. Prior to entering the University of Buffalo Dentistry College, Newton studied law under Judge Preston in Parishville and taught at his alma mater. Upon completion of dental school, he operated practices in Troy and Parishville, New York before assuming the patients of Dr. C. S. Ober in Massena in 1900. While Newton arrived in Massena by train, his father brought his dental equipment by sleigh. He opened his first office in the Russell business block, but moved his practice several times over the next five decades (Prince, 1967: p. 5).

Like Bushnell, Newton became convinced of the imminent federal approval of the Seaway and power project and made it his life's mission to keep the project in the national spotlight as well as garner support from other local residents. His most rudimentary method of spreading the gospel of the Seaway was to explain the social and economic promise for the area during and after the construction of the various facilities to any captive audience including many of his dental patients undergoing lengthy procedures. In an article in the *Massena Observer*, publisher Leonard Prince described his first teeth cleaning experience in 1928 and being apprised of the many reasons why the Seaway needed to be built and assured that the United States Congress would pass the project bill during its next session. Prince admits that while his hope waned as the years passed and no construction began, Massena natives led by Newton remained confident the Seaway would eventually be completed (Prince, 1967: p. 6).

After Newton conceded defeat to O. T. McGuiggan in 1945, he turned his attention full-time to convincing state and federal lawmakers of the urgency of passing the St. Lawrence Seaway legislation. As President of the Northern Federation Chamber of Commerce, he wrote to Senator George Aiken of Vermont, a long-time supporter of the Seaway, and attached a press statement sent to the *Rochester Times Union*, *Syracuse Post Standard*, and *Buffalo Evening News*. The opinion piece outlined the importance of developing the hydro-electric potential of the St. Lawrence River and challenged Seaway opponents to a public debate (Newton, 1945).

Contrary to most borderland residents, Horovitz, Chevrier, Bushnell, and Newton demanded the attention of state and federal policymakers and gained redemption for their efforts when the Seaway project commenced in 1954. The persistence of local leaders kept the Seaway in the spotlight. This group recognized the reluctance of state and national officials to provide funding for any economic or social programs that did not appeal to a national constituency and took it upon themselves to become the promoters of the economic future of the region. As Martinez indicated national politicians foster laws and policies that impact the masses and often neglecting isolated border areas. However, even with little political clout, Chevrier rose to a national leadership position and was able to gain passage of the Seaway and power dam project that for several decades fostered the economic prosperity of Cornwall, his hometown. Rather then sit back idly and criticize distant federal officials, each learned to work the system and the media to his advantage and gained prominence through hard work and perseverance.

The St. Lawrence Seaway and Power Project

The St. Lawrence Seaway and Power Project is often referred to as the "eighth wonder of the world." Covering 265 miles from Montreal, Quebec to the Great Lakes, the undertaking remains the largest jointly-built power production and waterway in the twentieth century. Twenty-two thousand workers labored on the simultaneously built, five sections of the project erecting dams and locks and dredging channels. On the Canadian side, engineers, property agents, and carpenters acquired and flooded 22,000 acres and seven villages, and moved 531 houses and 18 cemeteries. Operating engineers manned $75 million in equipment, while laborers poured six million cubic yards of concrete in all weather conditions (Parham, 2009). Dedicated contractors and their employees made financial and personal sacrifices to finish the job on time and on budget.

From 1954 to 1958, Massena and Cornwall residents witnessed an invasion of transient workers with different accents, religious beliefs, and social lives due to their towns' roles as the headquarters of the Seaway and Power Project. Prior to 1954, local politicians, church leaders, and school principals had dealt with issues related to the arrival of new residents with differing values and traditions during canal construction in the nineteenth century and the successive period of industrialization. Cornwall and Massena residents mutually disliked their towns being invaded by outsiders and even though Seaway and power dam workers and their families temporarily altered Cornwall and Massena's populations and social institutions, residents' clung to their regional identity. Historically, the residents of these two border towns had been exposed to outsiders from various regions of the country with different social and religious values sooner than their more homogeneous rural neighbors. But as in the past, residents would resist the cultural and social change and try to cling to their traditional values.

In August 1957 during the peak of construction on the US side PASNY contractors employed 6672, while Ontario Hydro contractors employed 6007 in June 1956. The maximum combined employment of 11,924 skilled and unskilled workers was recorded by Seaway officials in August 1957 (Parham, 2009). According to David Manley, a fifteen year old laborer on the project, "Some of the workers were local including some Indians from the reservation. Others came from Georgia, Alabama, Florida, and Virginia, particularly the engineers. Many worked in the spring and summer and returned home in the winter because of the cold" (D. Manley, personal communication, July 24, 2004).

On the Canadian side Bob Goodrich, the head of the employment office for Ontario Hydro, indicated that many of men constructing the Canadian side of the power dam had worked on the Niagara Falls project that had just been completed by Hydro. At that time, the agency had a core group of workers who moved from one power project to another. Other workers were from Cornwall or recruited through the Employment Service Office as demand warranted (B. Goodrich, personal communication, March 6, 2004).

John Dumas, the son of a *Watertown Daily Times* reporter, described the diversity of workers who came to live and work in his home town. "I am not sure there was any mold to build the construction workers that came here. They were all kind of different. We had one that stayed at our house as a matter of fact. We had a large four bedroom house in downtown Massena and used only three, so my grandmother rented a room to a construction worker. Our renter was a nice old southern man named, Seth. He told some great stories about going out in the woods of Kentucky or Louisiana and picking up a bear cub and trying to outrun Mama bear" (J. Dumas, personal communication, August 3, 2004).

College students comprised a large portion of the seasonal worker population in the US and Canada. During the summer months, they often filled laborers or machine operators' jobs. David Flewelling asserted, "In 1957 I was nineteen and I flunked of college. As part of a northeastern cooperative program I had spent previous summers making a dollar an hour as a labor foreman and chief laborer. In March of 1957 I hitchhiked from Pine River Junction to Massena, New York. The St. Lawrence Seaway was a big draw in those days because workers were in short supply and contractors were paying men high wages. I was hired the first week I was there by Perini as a draftsman on the Grasse River Lock doing rebar lift drawing. I was there from March until mid-July" (D. Flewelling, personal communication, November 30, 2004).

Besides diversifying the population of Massena and Cornwall, the Seaway workers and their wives established social relationships on both sides of the border allowing for a cultural transfer to take place through extensive border crossings and increased trade and consumer consumption. As Ambrose Andre, a concrete inspector for the Corps of Engineers explained, "I met my wife one Friday night at Picky's bar. She was a school teacher and was there with a friend. We chatted a little and to make a long story short, my friend and I picked them both up. The fellow I was with knew them both, so that helped. I took her home and made plans for a date a few nights later and we were married six months later" (A. Andre, personal communication, July 17, 2004).

Ray Singleton who worked on the American side as an operating engineer married a women from Cornwall exemplifying the cross border interaction highlighted by Martinez. "We went on strike in Massena and I spent a lot of time at the bars. That is when I met, Melba, the gal I married" (R. Singleton, personal communication, June 22, 2005). His wife Melba elaborated, "I would go over to Massena with four or five of my friends including my best friend Bessie, who had a little black car. We would drive over to dance and have a good time and go home. We were all in our late twenties and worked for Bell Telephone. A lot of people from Cornwall traveled to Massena and spent an evening over there. Cornwall didn't have places like that where you could go and dance and have a drink" (M. Singleton, personal communication, June 4, 2005). John Dumas explained, "At that point in time Cornwall's drinking age was 21 and ours was 18. Because of the lower drinking age, the Canadians were attracted over here by the droves" (J. Dumas, personal communication, August 3, 2004).

Seaway workers and their wives also enjoyed Massena's borderland location as it allowed greater access to shopping and personal services. Joyce Eastin, the wife of an Uhl, Hall and Rich engineer, reminisced, "I remember one time several of us went shopping in Cornwall. We would go and shop and stop and have lunch and come home particularly when the kids were in school" (J. Easton, personal communication, February 26, 2005). Her friend Ann Marmo added, "One of my favorite places to shop and get my hair done was across the river in Cornwall. I don't think I thought there were any good beauticians at the time in Massena. In those days the prices were much better in Canada than in the US especially on woolens goods, and clothing, so some of us would go over for the whole day and have some fun. We were different than the local women" (A. Marmo, personal communication, June 15, 2005).

Even the workers enjoyed the ability to cross the border to buy consumer goods. Jim Cotter explained, "We could go over to tailor shops in Canada and get tailor made clothing because subsequent to World War II Canadians encouraged skilled craftsmen from Europe to migrate to Canada and so there were things available over there that weren't available on the American side. They had some great hardware stores where you could find horseshoes that you couldn't find west of the Mississippi" (J. Cotter, personal communication, September 11, 2004).

The construction of the St. Lawrence Seaway was portrayed as an economic bonanza for Massena and the surrounding St. Lawrence County communities that bordered the St. Lawrence River. Numerous reports were published that marketed the area as a perfect location for manufacturing firms due to the availability of cheap electricity and the easy access to the Great Lakes and the Atlantic for transportation of finished goods. Plans were drawn up for the reconstruction of the town's roads and five schools were erected to accommodate the current and anticipated long-term increase in school aged children. However, once the bulldozers left town, the project had only enticed one new manufacturing operation, and the talk of economic grandeur fell by the wayside. The neighboring Canadian town of Cornwall, however, managed to take advantage of the opportunity and until recently was referred to as the southern capital of Ontario. The reason for Massena's lack of progress and failure to live up to the expectations of the Seaway planners has long been debated by local economic development officials. A main component of this stagnation can be credited to the area's historically ethnocentric mentality and its desire not to revisit its past social problems.

Conclusion

From the early days of settlement, the men and women of Cornwall and Massena created organizations that benefited and complemented their lifestyles in terms of government structures and houses of worship. Due to their isolated locations on their nation's periphery, these residents thought of themselves as different from people in the interior sections, causing a sense of otherness reflected in their development of similar economic, social, and political values and practices. They often saw laws as rules made by distant, insensitive and excessively nationalist politicians and often dealt with unruly residents and immigrant workers as they saw fit. The sparse number of voters and their distance from the center of power should have limited their political clout resulting in their demands for social and economic assistance and improvements being frequently ignored by decision makers. However, both area business men and politicians raised the money and garnered national approval for the construction of canals and eventually rallied for the construction of the St. Lawrence Seaway and power project. When national and state officials ignored these areas based on their isolated location, local leaders who had garnered political office based on their visions of the future forged ahead with their demands and kept them in the national spotlight even when their terms in office ended.

According to Martinez, towns like Massena and Cornwall should not have prospered or attracted manufacturing prior to the end of World War II. This however, is one of the main areas where the border towns in northeastern New York and southern Canada differed from those on the Mexican/US border. Their economic success in the nineteenth and early twentieth century occurred solely based on their geographical location that up until that point had been a disadvantage. The accessibility for manufacturers to cheap water power, navigable waterways, and non-union workers coupled with financial incentives from local government officials resulted in the industrialization of these two towns earlier than in other areas. Increasingly, the workers who manned the machines at these factories spoke different languages and harbored spiritual and cultural values and continued to diversify the population of Cornwall and Massena sooner than other regions. Crimes committed by these new arrivals often led to ethnic tension and social uneasiness that was played out on the front pages of the newspapers and in the criminal courts.

While the St. Lawrence Seaway and Power Project had been portrayed by economists and politicians as an economic bonanza, for the residents of Cornwall and Massena, it was another bout with an invasion of outsiders who threatened their quiet small town lives. At the beginning of the Seaway project in 1954, Cornwall and Massena residents still harbored a mutual dislike for men and women who held different spiritual beliefs or spoke a foreign language. Area inhabitants found the untamed lifestyle of Seaway workers to be unacceptable, and tried to curb their behavior with an increase in law enforcement and crime prevention initiatives. Local parish leaders also added extra Sunday services to accommodate workers' schedules. While Massena natives on the surface appeared more accepting of newcomers, they were happy to see them leave after the project's completion. With these workers came new cultures and religious traditions that taxed the patience of local residents.

The borderland location of Massena and Cornwall offered opportunities for greater consumer choices and transborder human relations for workers, their wives, and many single women during the St. Lawrence Seaway and Power Project. Many crossed the border to shop, dine, or meet a prospective mate. The geographical location of these two towns offered a unique experience for workers and their families, most of whom had labored on and lived near projects being constructed in the middle of nowhere. In this case, these temporary borderlanders established social and economic relationships across the border as had early settlers. These shared experiences fostered the development of similar beliefs and values that stood out from the national norm. As Jim Cotter, an engineer on the Seaway project concluded, "I've always felt that Massena residents due to their closeness to the Canadian border felt a greater attachment to Canada then they did to the United States" (J. Cotter, personal communication, September 11, 2004).

My research, therefore, offers a new interpretation of the life of residents on the US/Canadian border since the American Revolution. Like other borderlanders around the globe, Cornwall and Massena residents lived in a unique human environment and developed a set of values and beliefs that contrasted that of their compatriots in the heartland based on shared social and economic experiences. By exploring the lives of common people and being flexible with my analysis and source material, I uncovered a different perspective to existing US/Canada history that has an ideological, national or northwestern focus. Combining the techniques of local historians and the theory of Mexican/US border scholars, I have provided a framework for other scholars to expose the differences in values, economic progress, and social ethnocentrism of local border residents in the US and Canada from those in the heartland.

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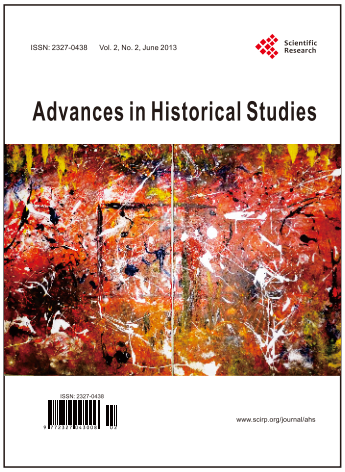

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