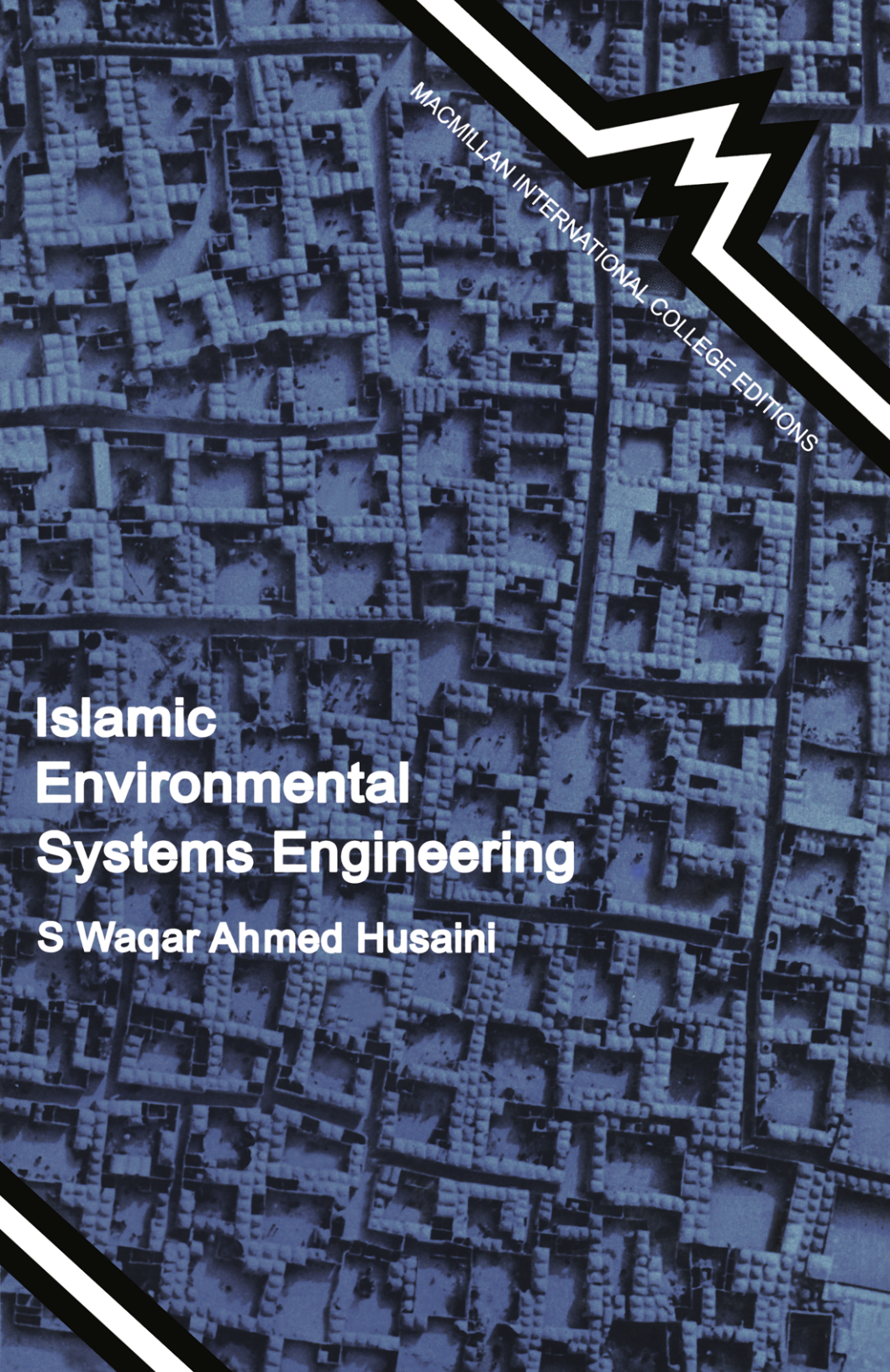

Islamic Environmental Systems Engineering

S Waqar Ahmed Husaini

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Islamic Environmental Systems Engineering

A systems study of environmental engineering, and the law, politics, education, economics and sociology of science and culture of Islam

S. Waqar Ahmed Husaini

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1 The Quranic spirit

Islam

Islam means a state of health or of nature. From *aslama*, meaning 'he submitted himself or he entered into peace', is derived the name of the system, Islam, and the name of its adherents, the Muslims.[1] Islam is the primordial state of health or nature in which God (*al-Ilāh* or *Allāh*, lit. 'the God') created man and the universe. It is through submission to God's will that peace and the realisation of one's destiny can be achieved. Islam is the natural religion of everyone in the universe: 'And whoever is in the heavens and the earth makes obeisance to God only, willingly and unwillingly, and their shadows too, at morn and eve.'[2]

The whole realm of nature is a revelation of the will of God.[3] The divine will is manifest in the creation of heavens and earth, the alternation of day and night, and in the variety of flora and fauna,[4] or in the hydrodynamic law which governs the interface between fresh and salt waters, and keeps them apart.[5]

Primordial man, endowed innately with personality and a capacity for knowledge, was given consciousness of his free ego, capable of doubt and disobedience as well as of exercising moral choice, to alleviate the painful realisation of human wants.[6] Out of this consciousness were born the first stirrings of human culture. Men have since scattered all over the globe displaying a 'diversity of languages and colours,'[7] engaged self-consciously as movers and moulders of history.[8] The employment of the ratiocinative method reveals the will or laws of God in the conduct of history. The succession of historical events is determined by certain cause and effect relationships between men and their ideas and efforts, reacting with the natural milieu of the physical world. How many a system or civilisation has passed away?[9] How many a town lies in ruin, and how many a well and a palace is deserted?[10] The laws governing the alternating good and bad days among nations reflect, like the laws of nature, the working of the divine will.[11] 'In their histories there is certainly a lesson for men of understanding.'[12]

Mankind obeys the will of God by the discovery of, and loyalty to, its own ideal self; by the discernment of the purpose of creation, the meaning and mission of life; and by consciously conducting individual and corporate life according to the fundamental pattern ordained for them.

There is intrinsic goodness, beauty, harmony, and orderliness in the creation.[13] Everything in it – the sun, the moon, the stars, the resources of the earth – has been created for man's benefit and enjoyment.[14] The universe was created with a purpose as a necessary environment in which man might fulfil the divine trust which he had accepted. This was the endowment of personality, consciousness, knowledge, and the concomitant powers to exercise the vicegerency (*khalīfa*, caliphate) of God in the earth.[15] This trust constitutes a challenge to man's ethical nature which must be proven through successful acquittal in the tests undertaken in the crucible of this worldly environment. 'Surely we have made whatever is on earth an embellishment for it, so that we might try which of them (among mankind) is best in deeds.'[16] The *raison d'être* of man must be to realise this higher destiny by 'his actual interference in the flow of nature and history, his diversion of that flow away from value-violation, towards value-realisation'.[17]

Islam is a predetermined, passive submission of the perceptible universe to laws of its immutable nature – except for mankind. For mankind, Islam is not a static, deterministic condition of being or believing. Islam is a dynamic process of faith-in-action. A Muslim must be always striving to become a better and fuller Muslim by bringing his self-will in accord with God's will.[18] 'O ye who believe! Enter completely into *al-Islām*'.[19] 'That you shall certainly ascend to one state after another'[20] is the vista of life opened up for man here on earth and in the hereafter conceived as a continuum.

The attainment of Islam in human societies – man living in peace within, and in peace without in the world of external relations – is contingent upon individuals and societies conforming to God's will within the limits of human nature and capabilities, and the material realities in a given milieu.[21] The fundamental pattern of the will of God, revelation, is manifest in 'the whole order of nature', in 'the whole process of history', and in the scriptures revealed through the prophets of God.[22] In Quranic terminology, the divine law or God's will is revealed in His *āyāt*. The word means both 'portents' in nature and history, and the 'verses' of scriptural revelation. This whole system is Islam, the way, course, or custom of God (*sunnat-*, *fitrat-*, or *khalq-Allah*).[23] Those who abide by this way, course, or custom of God are the 'helpers of God' (*ansar-Allah*[24]), 'friends of God' (*awliya-Allah*[25]), and the 'party of God' (*hizb-Allah*[26]). They are co-workers with God. They become worthy of God's trust as His 'real' caliphs or rulers on earth as individuals, nations, and civilisations.[27]

Revelation and reason in the Quran

The concept of revelation[28] as expounded in the Quran is significant on many counts.

The scope and function of scriptural revelation

Exposition of the essence or nature of God is not the subject of revelation. Vision cannot comprehend Him and none is like Him. God does not reveal Himself. He is the unique, transcendental, incomprehensible reality. Only His will is revealed through His works in the universe, and as scriptures. Scriptural revelation has always parried human inquisitiveness which sought to know who or what is God and, instead, directed man to observe God's creations, understand how they work, use them for human advantage, and abide by His moral command which enjoins social justice and prohibits mutual oppression.[29] Theological scholasticism and speculations would be similar to scientific scholasticism in their harmful consequences. Meditation on the nature or reality of electricity would be futile. We must rather accept scientific 'beliefs' as constructs aiding mental imagery, and concentrate on scientific 'facts' understandable by human faculties in order to apply them for utilitarian purposes.

Scriptural revelation provides man with the necessary and sufficient knowledge of metaphysical subjects (*al-ghayb*, the unseen) such as the existence and attributes of God, life after death, and the purpose of man and universe. These unobservable aspects of reality are beyond the range of human perception, and cannot be proved or disproved by scientific observations or speculative thought.[30] The proper attitude towards these non-demonstrable metaphysical postulates of religion is to accept them on faith without attempting to prove them since they are for the betterment of mankind.[31]

Thus scriptural revelation limits the burden of dogma and proscribes scholasticism.[32] In particular it limits the scope of dogmatic theology which is the bane of religion since, by creating sectarianism and rationally insolvable dissension, it prevents co-operation among moral men in dealing with problems of social ethics and justice.[33] One of the basic goals of scriptural revelation is to emancipate man from the futility of mystical and dialectical theology, metaphysics, idle introversion, and other psychic exercises. This liberates man's thought and action for involvement in real social problems, and the growth of humanism. The birth and explosive growth of Muslim science and civilisation soon after the advent of the Prophet Muhammad was due to the triumph of this Quranic concept of revelation when it was correctly understood and applied by those generations of Muslims.

Succession of Prophets, and culmination of scriptural revelation

A special kind of revelation makes use of the institution of prophethood. Textual or oral verses (*āyāt*) were communicated for the guidance[34] of mankind through divinely inspired prophets who were ordinary mortals.[35] Prior to the Prophet Muhammad 'there is not a people but a warner (prophet) has gone among them'.[36] All nations had prophets, who

preached in the language of their people, a few of whom are mentioned in the Quran.[37] Belief in all the prophets and their original scriptures is an indispensable Muslim confession emphasised in the Quran.[38] The prophets were chosen from among their people by God.[39] They were not the authors of the scriptural revelations. They merely communicated the divine guidance to people under the command of God.[40] Thereafter they were not responsible for people's acceptance or rejection of revelation. The prophets were mere advisers, reminders, reformers, and the messengers of scriptural revelation. They were admonished not even to grieve when people denied God and rejected Islamic ethics since by doing so they were only exercising the freedoms granted by God Himself. Freedom of conscience was not to be abridged even by a prophet.[41]

The prophets form a spiritual brotherhood. 'We make no distinction between any of them.'[42] Every scriptural revelation in its pristine purity was in essence Islam.[43] Every prophet was a Muslim.[44] The followers of other prophets were also called Muslims.[45] Thus various prophets preached the Oneness of God and mankind, essentially the same social ethics and cosmological doctrines, and the same basic premises and institutions for the realisation of social justice.[46] However, the generations that succeeded the prophets 'differed only after knowledge had come to them out of envy among themselves'.[47] These followers of earlier scriptural revelations fell into error due to ignorance; or they altered and fabricated, and differed with, their scriptures.[48] They concealed substantive parts of their scriptures, trampled upon human dignity, imposed socio-economic injustice, invested their priests and leaders with divine powers, persecuted reformers and followed tyrants.[49] In short, they adopted many ideas and customs alien to those that were actually revealed through a chain of prophets.

The Quran was revealed to reaffirm and restore Islamic values and ideology to disparate segments of mankind;[50] to preserve those ideas and institutions which have permanent value;[51] to replace by something similar or better what was changed or abrogated from earlier scriptural revelations; and to complete the ideological and institutional evolution of Islam.[53]

These postulates have a profound influence on every aspect of Islamic culture: doctrine and ideology, science and learning, law and politics, international relations and socio-cultural dynamics. There are no innately superior and divinely chosen individuals, groups, and nations. 'O mankind, surely We have created you from a male and a female, and made you nations and tribes that you may know each other. Surely the noblest of you with God is the most dutiful of you.'[54] The Islam of the Quran and the Prophet Muhammad was a movement to restore and revive true ideals, and reform mankind. Therefore, the Islamic methodology for social change in every age calls for reform and purification, not bloodthirsty revolutions to obliterate an existing socio-cultural system, and eliminate its adherents or certain classes. The Quran portrays all

prophets as originally true, dissociates them from their distorted characterisations, and presents them as models of personal and public morality.[55] This should create among Muslims respect and tolerance for other cultures, and recognition of areas of agreement and disagreement among Muslims and other ideological groups. In the extant pre-Quranic scriptures and philosophies, and the cultures developed in their name before and since the prophet Muhammad, Muslims should discover ideas and institutions compatible with Islamic culture, and assimilate them as part of Islamic heritage. Muslims should develop a critical but co-operative attitude towards non-Islamic cultures, and foster an international community of shared values.

Prophetic transmission of scriptural revelation was terminated with the Quran and the Prophet Muhammad since God's mission was completed: 'This day have I perfected for you your religion and completed My favour to you and chosen for you Islam as a religion.'[56] God has promised to guard the Quran against corruption of its text.[57]

We notice in the *raison d'être* of prophets, and in the attitudes of the prophets and their peoples before the Prophet Muhammad, an extreme reliance on scriptural revelation in decision-making, even in elementary and inconsequential matters.[58] This also confirms their generally lower level of perception, and the unpreparedness of mankind for self-sustained growth. The revelation of the Quran was to inaugurate a new methodology in history. With mankind coming of age, and civilisation becoming capable of guarding its heritage of scriptural revelation, there arose the necessity to send the last prophet of Islam. For prophethood was essentially 'a mode of economising individual thought and choice by providing ready-made judgements, choices, and ways of action'. In order to allow the potential flowering of the inductive intellect, it was necessary to inhibit 'the formation and growth of non-rational modes of consciousness'; and 'in order to achieve full self-consciousness man must finally be thrown back on his own resources'.[59]

'The abolition of priesthood and hereditary kingship in Islam, the constant appeal to reason and experience in the Quran, and the emphasis that it lays on nature and history as sources of knowledge, are all different of the same idea of finality'[60] of prophethood. The Muslims in every generation must be, therefore, the most emancipated people of the world. They must realise the full implications of this principle of finality of prophethood by controlling, moulding, and directing the flow of nature and history through development of science, technology, and rational methods of social organisations under the moral commands of Islam.

Reason, empiricism, traditionalism, authority, and freedom

Scriptural revelation delineates the scope, function, and limitations of different sources of knowledge. The Quran proscribes dialectical theology and metaphysics, and inward looking mental and spiritual postures. It diverts human potentialities towards God's creations, the real world of

mind and matter, men and history. By obliterating the distinction between the natural and supernatural, and employing the teleological argument to prove the existence and providence of God; the Quran trains the mind to see and the heart to feel ever more clearly, with each new breakthrough in the physical and social sciences, the purposeful working of God's creative will and man's moral purpose in life.[61]

The Quran is unique in its emphasis on the finite, the determinable, and the demonstrable aspects of reality. On every page the *āyāt* exhort mankind to gain knowledge through critical cognition of the *āyāt* of God in the laws and phenomena of nature, and in the lessons of history. The cognition and programmatic application of these *āyāt* of God are the realm of reason and the focus of Islam.[62]

The appeal to reason and its exaltation go hand in hand with the command for all men and women to acquire knowledge and wisdom,[63] to study and use the forces of nature,[64] and to learn from the histories of nations.[65] Those who do not employ their sense perceptions in the pursuit of knowledge for ultimate ethical goals, and pass up His multifarious and ubiquitous *āyāt*, are deaf, dumb, and blind; they are worse than brutes and beasts.[66] Rejectors of the 'signs' of God – those who do not gain practical benefit and wisdom through a purposeful study of the natural and social sciences – experience the deserved dire consequences and are losers.[67]

Islam condemns traditionalism; the claims to superiority on the basis of priority in time, blind imitation, and veneration of ancestors and their legacies.[68] It condemns unconditional allegiance to relatives through bonds of blood and marriage,[69] to authoritative leaders or professional priests,[70] and to one's own race or group or nation.[71] Even God-sent prophets, or what is ascribed to them, should not be believed and followed without the sanction of natural reason.[72] In short, Islam condemns the morality of submission. It extols freedom of thought, and self determination for each individual and generation.[73] The limits of allegiance to authority are delineated for members of an Islamic polity.[74] One of the greatest threats to freedom of thought and conscience, and the independence of individual and collective judgements, comes potentially from priests who look upon themselves as infallible and issue commands with monopolistic claims to perception of truth and the right to govern polities. In this sense theocracy and priestcraft are akin to contemporary forms of authoritarianism, however defined. Such onslaughts on the freedom of will by a priesthood, or its secular counterparts, are deemed to be the highest form of crime – *shirk*; that is, the objective attribution of divinity to any but the One God, or the subjective attribution of semi-divine powers and qualities to priests or secular leaders at the helm of affairs.[75] Our unconditional loyalty is only to the ideally determinable will of God which encompasses only that which is good and right and useful.[76] Each individual and each generation must endeavour to determine what precisely might be the divine will by referring every social concern and

juridico-political issue to the permanent values of scriptural revelation.

An aspect of Quranic empiricism, inculcating an outward-looking catholic attitude, is its command to travel in 'the spacious earth of God', to educational and spiritual benefits.[77] The importance of the rational and critical faculty is further brought out in the Quranic rationale for freedom of conscience for those who cannot or would not accept Islam of their own volition.[78] The duty of every prophet was 'only clear deliverance of the Message'.[79] 'And if they reject you (O Muhammed), say: My work is for me and your work for you. You are clear of what I do and I am clear of what you do.'[80] 'And We have not appointed you a keeper over them, and you are not placed in charge of them.'[81] 'There is no compulsion in the religion (of Islam).'[82] When rational exhortations and the fairest means become futile in convincing others of one's point of view,[83] instead of mutual revilement,[84] there should be mutual acceptance of residual differences in belief and ideology. The final resolution of mutual differences, the conflicts of ideologies and civilisations, is possible in the womb of time, and on the Day of Judgement. 'And in whatever you all differ, the judgement therof is with God.'[85] God endowed men with innumerable favours[86] and made the freedom of man in all its implications inviolable: 'And if your Lord had pleased, all those who are in the earth would have believed together. Would you then compel people until they are believers?'[87]

Critique of pure reason

Even in matters pertaining to the self-evident and rationally perceptible natural rights of man, and the demands of social justice, reason must be guided by an ego developed in the consciousness of God's signs. This is a necessary check on pure reason lest it be swayed easily by inordinate desires; social distortions; vested interests; and by the unscrupulous holders of power by force and fraud as well as the trusted majorities created by triumphant electioneering caucuses. Natural reason and natural law have been invoked for unholy causes throughout history.[88] The Quran, therefore, provides guidance in ranking values, and warns against the rationalisation of baser instincts.[89]

Reason and scriptural Revelation are complementary

False consciousness and unfair rationalisations are not the product of pure reason and pseudo-religions alone. Post-Quranic history shows that Muslims themselves have often thwarted to various degrees the Quranic imperatives.[90] Just as explanation of this must be sought ultimately in human weakness and man's moral freedom, the solution to this problem lies in dedication to meliorism which is the basic postulate of the Quranic doctrine of man.[91] We shall not dwell upon the misfeasance and imperfect actualisation of the ideal patterns of Islamic culture. This is not the same as operating in a vacuum of values. As long as there exists an ideal pattern of culture – moral and rational – such as Islam, it will demand man's

striving for it. The ideal pattern of Islamic culture will produce gadflies – now claiming martyrs, now bringing mankind closer to its destiny.[92]

Reason and experience, along with other sources of positive knowledge,[93] are indispensable to verify the claims of intuition, and the social doctrines postulated by any religion or ideology. Without this critical cognitivism there would be no way to forestall the tyrannies of dogmatism and rationalisations of false consciousness. Despite the relativity and imperfection of human knowledge, the fallibility of reason and judgement, and the corruptibility of individual and social will, the Quran elevates and endorses the non-inspirational sources of knowledge. It makes them the arbiters of the veracity of the Quran itself. 'Will they not, then, ponder on the Quran? Had it issued from any but God, they would have found in it many an incongruity.'[94]

The proper role of scriptural revelation is assistance of reason. It neither seeks to overpower and replace the rational faculties nor is it the gratuitous dispenser of material facts. Even when it enunciates ethical truths, it is incumbent upon man to rationally investigate their ideological and programmatic details, and establish them on earth.[95]

Axiological systematisation as methodology for apprehending the Quran

The Quran expresses its doctrines lucidly in 'plain Arabic language' which is 'easy for admonition'.[96] This is generally true of those facts and principles whose cognition is direct and decisive (*muḥkam*). Complex principles can only be rendered in succinct phrases that are by design and implications conformable, or allegorical (*mutashābih*).[97] Ellipticism is the philological characteristic of the Arabic idiom and even more so of the language of the Quran.[98] This again makes for the infinity of the Quran, rendering a particular verse, or verses on a particular subject taken together, applicable not only to several situations in diverse frames of reference but capable also of multiple interpretations. The ellipticism and comprehensiveness of the Arabic Quran put at a premium sincerity, positive commitment to Islam, and profound knowledge and worldly wisdom in order to adopt it to real time-space situations.

This organic tension between and among the Quranic verses, and the values they seek to realise, demands an axiological systematisation of the Quran.[99] This entails differentiation of the levels of meaning and generality of the values and specific legislation of the Quran. A distinction must be made between the instrumental goals and their terminal goals or intrinsic values. An axiologically systematised Quran enables hierarchisation of the Quranic ideally-existent or terminal values, and facilitates application of hierarchies of strategies by assigning to ends their proper means according to our best knowledge. These hierarchies would give us different arrays of strategies due to the complexity of relations arising out of their permutations and interactions, and in response to the exigencies of the circumstances and changing material realities.

The barriers to rational apprehension of truth are at least as much due

to lack of refinement of the instruments of perception as they are due to subjective factors; that is to say, value judgements and prejudice. Among the tools of apprehension for rational decision-making are such non-qualitative factors as the availability of factual data, cybernetics, and feedback.[100] The apprehension of Quranic verses is dependent upon, and must be kept abreast of, one's level of perception of God's *āyāt* in nature (that is, knowledge of the natural sciences), and His *āyāt* in man and his society (that is, knowledge of the humanistic-social sciences). For example, we were given conditional permission for polygamy with widows and orphan women subject to the constraints of justice. More than 1300 years after the revelation of Quran, demographic statistics are now becoming available on the breakdown of male-female ratios by age. Such statistics are necessary, though insufficient, for legislative and judical processes to determine whether or not objective conditions of potential injustice exist due to excess of unmarried females in relation to marriageable single males, thus establishing a valid ground for limited polygamy by a few.[101]

All human thought, of whatever genius or generation, is relative to the temper and accomplishments of the unique temporal milieu. Time is a parameter in the social, intellectual, material, and technological accomplishments of civilisation reflecting the cumulative wisdom of ages. The Quran must be constantly re-understood in each age through rigorous application of the refinements in our intellectual, institutional, and technological tools of apprehension.[102] 'And make not haste with the Quran before its revelation is made complete to thee, and say: My Lord, increase me in knowledge.'[103] The permanence and immutability of the verbatim Quran is supremely meaningful, axiologically rather than epistemologically.[104]

Infallibility[105] (*'ismah*) is a Divine attribute. The Prophet Muhammad was fallible, and his personal knowledge was limited.[106] Neither the consensus (*ijmā'*) of the Muslim community nor that of its specialists and scholars in any age can claim immunity from error, or from the constraints of time-space limitations. Each generation is independently accountable for its social choices and decisions.[107] No individual Muslim can claim finality and perfection for his opinions and judgements (*ijtihād*). This principle of absolute knowledge, wisdom and infallibility of God, and the uncertainty and inconclusiveness of human knowledge and institutions is a cardinal doctrine of the Quran. These notions are further emphasised in the Quran by conceding the possible existence of irreconcilable differences among people in their ideas, beliefs, and institutions. These differences will be resolved through the triumph of truth in the course of history, or arbitrated by God only on the Day of Judgement.[108]

Quranic personal and social ethics: concept of man, nature, and altruistic humanism

The fundamental doctrine presented in the Quran is that human felicity, in this and the other world, is possible only through the understanding of

the will of God manifest in the laws of human nature and science and their proper application through ethical, social action and an ethically constrained technology. The unilateral pursuit of the will or laws of God in human nature and society creates a culture with a premium on personal piety and law-abiding citizenship but one which is materially underdeveloped and industrially and militarily weak. This has been the characteristic of Muslim civilisation during the last few centuries between the decline of the medieval Islamic 'idealistic-rational' culture (see Chapter 7) and the contemporary stirrings of its revival in this century. On the other hand, the unilateral pursuit of the understanding and application of the laws of nature through science and technology, with or without the consciousness of God, creates a unilaterally materialistic and technological culture that should be, ultimately, in conflict with itself and ethical societism. This has never happened in the history of Muslim civilisations. The best examples of such cultures are the Western civilisations of this century, the secular as well as the Marxist-Leninists. The basic concepts of these integrated Quranic ethics are discussed below.

Man's activity in nature and history must proceed along with the development of his inner or spiritual consciousness, 'the interiorisation and introspection of the moral motive'. This is the basic plan of the genuinely Islamic *sufi*, mystic spirit, which aims at the purification of the 'heart', or man's most basic motives and emotions. However we must vigorously deny as being Islamic that particular brand of Sufism, inspired by theosophy and popular religion; which betrayed true Islam by avoiding the development and application of the natural and social sciences (*the āyāt-Allāh* in nature and history), for the establishment of social justice on earth.[109] Without such consciousness man's struggle for social justice degenerates into class hatred and mutual oppression, or succumbs to vanity and cynicism.

To achieve this consciousness one must personalise the metaphysical and ideological essence of scriptural revelation: faith in the true concept of God, man, man's mission in life and history, and an awareness that all human intentions and actions are subject to the judgement of God in this world and in the hereafter. Such spiritual consciousness of mystic experience is not an end to be cultivated and enjoyed for its own sake. It is meaningful only for action in the domains of nature and in the warp and weft of history through exteriorisation of its impulses. One such field of action, coexistent with the 'acquiescence' of spiritual consciousness, comprises the realms of Islamic fundamental and derived law (*sharī'a* and *fiqh*). These elaborate a doctrine of duties defining the rights of individuals (*huqūq al-'ibād*), and the rights of society (*huqūq-Allāh*, lit. the rights of God).[110] The Islamic socialisation of men and nations takes place when this spiritual consciousness, and the ideas, attitudes, and institutions emanating from it, permeate into their ethos. This spiritual-ideological culture provides the matrix for the 'doing of good deeds' which are the

primary concern of the Quran and the test of a real Muslim. 'Islam is not a church. It is a state, conceived as a contractual organism . . . and animated by an ethical ideal, which regards man . . . as a spiritual being understood in terms of a social mechanism, and possessing rights and duties as a living factor in that mechanism.'[111]

Despite his earthly origin, birth, and sojourn in life,[112] man is a heavenly creature en route to a spiritual life in the eschatological other-world. This earthly life is a proving ground,[113] and supremely important to him: 'And whoever is blind in this (world), he will be blind in the Hereafter and further away from the path.'[114] Man's primordial nature is of the best kind, and the spirit of God was breathed into him.[115] He is gifted with faculties and favours.[116] Not only the earth and its resources have been created for his enjoyment,[117] but the universe itself has been made subservient to him.[118] Endowed with a unique and superior personality,[119] capable of making moral decisions and exercising choice between alternatives,[120] the children of Adam have been appointed God's caliphs or vicegerents in the earth.[121] The potentialities of man's natural disposition can be stunted or fostered.[122] Guided by scriptural revelation whose law for man is reason; this intelligent creature ought to exercise his freedom of thought and choice to equip himself with the right motivations, attitudes, principles, ideas, values, and criteria, and act righteously in a self-developed moral-material milieu propitious for his highest potential development.

Haste,[123] avarice,[124] impatience and irresolution,[125] arrogance,[126] ingratitude,[127] exhibitionism,[128] and self-destructiveness,[129] and the inordinate love of desires, women, wealth and property, are the mark of human frailty.[130] However, these frailties are neither his nature nor are they traits predetermined for any race or individual. Equipped with the faith-in-action programme of Islam in its totality, men can and must avoid succumbing to the temptations of a materialistic-individualistic life of this-worldliness, 'taking his desire for his god'.[131]

Nor should men make a religion of asceticism, world renunciation, or self-mortification. Islam forbids monastiscism.[132] Islam rejects a dichotomous religious-secular *Weltanschauung* which pretends to resolve the antinomy of material-spiritual values and powers through mutual exclusion and separation. In an Islamic way of life, there is no place for a class of preachers living off professional priesthood, nor for 'seculars', the 'moral men in an immoral society' who plunge into the pursuit of world-affirmation free from moral constraints.

The balanced way of Islam[133] envisions an integrated way of life in which all facets of individual and social life receive due emphasis in its hierarchy of values. Each individual and community must strive for its share of life's beauty and bounty. The enjoyment of good things is made lawful for all men and women. 'Say: Who has forbidden the adornment of God which He has brought for His servants, and the good things of His providing?

Say: They are for the believers in the life of this world.' 'And seek the abode of the Hereafter by means of what God has given you, and neglect not your portion of the world.'[134] Severe punishment in the Hereafter is earmarked for 'self-oppressors' who would abdicate their natural rights, though they had the power to strive and fight for them.[135] Should the overwhelming odds at a particular time and place preclude this, then people should migrate to places where there are abundant resources and freedom.[136] The pursuit and enjoyment of human rights is a sacrosanct duty.[137]

God's laws of creation and causality, being objective and neutral, help whoever invokes them for whatever ends.[138] These natural laws and social forces are perceptible and predictable for men of knowledge and wisdom who should locate themselves in the path of favourable consequences. 'Say: All is from God. But what is the matter with these people that they make no effort to understand anything? Whatever good befalls you, it is from God; and whatever misfortune befalls you, it is from yourself.'[139] Adversity and dysfunction are the pragmatic proof that somewhere we have run afoul of the Supreme Will.[140]

Life, however, is purpose as well as endeavour. The stirring of the original impulse in the minds and hearts of men for any progressive or retrogressive movement is a human responsibility. 'God changes not the condition of a people until they change that which is within themselves'.[141] Individual abdication of social obligations and moral responsibilities, blind imitation of authority and hero-worship, and social apathy or neutrality in moments of moral crisis ultimately lead to disastrous consequences for the entire society, the complacent, purposeless drifters as well as the actively vicious.[142] The hand of God is in intimate touch with history. In the long run what is good and beneficial to mankind endures, and truth and right triumph.[143] Since the hierarchy of leadership reflects the dominant norms and the pervasive will of the society, nations and civilisations can be saved from destruction through social action and reform initiated by morally brave men fearless even of death.[144] Individuals may not seek extraneous scapegoats with impunity for their misfortunes and degradations. They cannot blame God, for 'God wrongs not mankind, but mankind wrongs itself'.[145] They cannot shift the responsibility to external forces like Satan, or indulge in mutual recrimination and blame the men in authority.[146] Singly and jointly, men must themselves accept the responsibility for everything.[147]

Those who undertake a struggle to secure Islamic human rights and social justice will discover a strong ally in the true disposition of man which will throw off the yoke of mountebank priesthood or secular powers. About 1400 years ago such dormant potentialities of the true human nature were released under the full glare of history. A new generation was created through the ideology of the Quran and its living example of the Prophet Muhammad. Various nations and races co-

operated in unparalleled enthusiasm with the early post-Quranic generations of Muslims to establish Islamic culture and state in the place of existing religions, empires, and civilisations. This renascent human spirit changed the ideas, beliefs, politico-economic conditions, and other cultural phenomena in the Arabian peninsula, the Sasanian and Byzantine Empires, North Africa, Southern Europe, East Asia, India, and other regions. The same can be achieved today by arousing the potential of true human nature to establish Islamic social justice.[148]

Out of the two alternatives, men are under the moral imperative to choose the 'uphill road' that entails hardships for its votaries, because of the sacrifices demanded in providing liberty for mankind, and freedom from hunger, poverty, and degradation.[149] True Muslims believe that the 'heritage of the heavens and the earth belongs to God' Who has made mankind his trustees.[150] Therefore, they 'strive in the way of God with (their) wealth and lives' for familial and public welfare, and the cause of social justice.[151] What 'belongs to God', or is earmarked and utilised in the 'way of God', constitutes the rights of society in contradistinction to the rights of individuals. The real Muslims, when summoned to wage a relentless struggle eventually escalating into a just war, readily dedicate their life to defend the rights of society: 'And why should you not fight in the way of God, and the weak among the men and the women and the children?'[152]

The hypocrites are those who profess to be Muslims but 'they say with their mouths what is not in their hearts'. They are niggardly, evade their responsibilities towards the rights of society, and do not 'strive in the way of God with their property and their persons'. They fear to make a moral commitment in moments of social crises, are greedy recipients of public assistance, and perform their social duties reluctantly or under duress. Though well endowed with the blessings of life, such as health and wealth, they refuse to pay their due to the state and to fight for truth and social justice for fear of diminution of their life span and the pleasures of this life. Therefore, the hypocrites deserve 'the lowest depths of the Fire' or hell.[153]

Disbelief in God and Islam (*kufr*), and hypocrisy (*nifāq*), in the Quranic sense are either the outright denial of value to the world, or the egotistic pursuit of the world and its attractions to the extent of their idolisation. Hypocrisy is also the evasion or replacement of Islam's goal of social justice by ostentatious pietism. The denial of Islam by contending alternate doctrines in dogmatic theology, such as the beliefs of Judaism and Christianity, are unimportant as long as they do not amount to rejection of Islamic personal and social ethics.[154] For this is the central concern of God for His creatures. 'Have you not seen him who belies the religion (that is, Islam)? This is he who repels the orphan and urges not the feeding of the needy. So woe to the worshippers who are heedless of their prayer; who would be seen (at worship) yet refrain from acts of

kindness.'[155] True piety does not consist of complying with outward religious forms.[156] It consists of harnessing individual drive for material or psychic benefits in the service of social goals through a progressive widening of the sphere of potential beneficiaries: 'and do good unto your parents and near of kin, and unto the orphans, and the needy, and the neighbour from amongst your own people, and the neighbour who is a stranger, and the friend by your side, and the wayfarer, and those whom your right hands possess (that is, those under your guardianship).'[157]

It is the persistent theme of the Quran that the utilisation of the resources of the earth and heavens 'in the way of God', that is, for the common benefit of mankind, is also in the best interests of the individual in the long run. This should not be construed as a personal loss or self-sacrifice by individualists; it is their real self-fulfilment.[158] Islam calls for individual self-fulfilment within and through its scheme of social justice, and creative altruism or humanism. The self-seeking of materialists and hedonists is a persistent satanic delusion. 'And let not those who are niggardly in spending that which God has granted them out of His grace think that it is good for them. Nay, it is evil for them.' 'The devil threatens you with poverty and enjoins you to be niggardly, and God promises you forgiveness from Himself and abundance. And God is ample-giving, knowing.'[159]

Islam postulates a functioning brotherhood of sincere Muslims,[160] and their progressively widening sphere of co-operation with the sincere followers of earlier prophets on the basis of a community of permanent values.[161] Regardless of dogmatic or sectarian religious differences, men of goodwill who believe in transcendental values and external norms of objective judgement implied by belief in God and the Day of Judgement, and are doers of good deeds should establish on moral foundations a community of common interests. The competition among them should be in doing good deeds.[162] Individuals, nations, and civilisations are being judged for the direction and content of their efforts through endowments, wealth, family and progeny, comforts, and adversity[163] bestowed upon them unequally.[164] Individuals, nations and civilisations who violate God's 'signs' and commandments in nature and on social behaviour; who cultivate the arrogance of knowledge and achievement and wealth and power;[165] and claim self-sufficiency and immunity from accountability to norms or forces besides themselves;[166] are being constantly weeded out through historical processes which generate social conflicts.[167] Out of these processes arise the real vicegerents of God, leaders of men and nations who are worthier of His trust. They are more knowledgeable about the 'signs' of God in nature and human relations, and are better doers of good deeds.[168]

To help those who would not help themselves is a principle excluded from God's conduct of history. 'And surely God helps him who helps Him.'[169] 'Those who strive on Our account, them will We guide to Our

paths.' 'Verily man shall get only that which he strives for.' 'Surely God changes not the condition of a people until they change what is in themselves.'[170] Those who live in peace and harmony (Islam) with nature and history, making them instrumental to and congruous with God's moral law and purpose for mankind, are co-workers with God. The natural laws, the potential of human nature, and the social or historical forces become subservient to their will in proportion to their own exemplary execution of His will. They are the *anṣār Allāh*, the *awliyā Allāh*, and the *ḥizb Allāh*. They alone are the real Muslims, whether or not they profess to be Muslims in the legal context or as demographic statistics. What a person becomes and does is more important than his professed ideas and beliefs. Whenever the professed Muslims are led astray from the Quranic or Islamic ideal culture, through misconceptions and misdirections, or behavioural non-conformity and misdeeds, God's objective and impartial laws[171] take their course, fulfilling their promises of rewards, and threats of dire consequences.[172] Then another people, who will be real Muslims, better imbued with Islamic ideas, values, and character, and properly equipped with the ancillary institutions, will carry the burdens of civilisation and lead man towards his destiny. 'Behold! You (Muslims) are those who are called to spend in God's way, but among you are those who are niggardly; and whoever is niggardly is niggardly against his own soul. And God is self-sufficient and you are needy. And if you turn back He will bring in your place another people, then they will not be like you.'[173]

However, the establishment of true human dignity and social justice requires also an environment of material development and prosperity. The latter requires an understanding and application of the 'signs of God' in the cosmos, that is, the development of science and technology in the Islamic monotheistic and ethical contexts.

2 Islamic jurisprudence: revealed law (*sharī'a*), and derived or substantive law (*fiqh*)

Introduction

The basic characteristic of the Islamic legal system is its dual bases in scriptural revelation, and in the evolving needs and problems of the geophysical and social environments. God, the law-giver, made moral exhortations, delineated permanent values by which to distinguish good from evil and right from wrong; and gave a few concise legal ordinances in the Quran. The Quran, and the 'legal, binding *Sunnah*' or Traditions of the Prophet Muhammad together provide the subject matter for Islamic revealed law, *sharī'a*.

The *sharī'a* ordinances either cover only general principles, or provide detailed legislation on issues which, being rooted in the basic elements of human nature, are independent of sociological and technological factors. The attribution of *'ismah* only to God provides flexibility and multiplicity in human understanding of *sharī'a* ordinances.

The rulings of Islamic derived or substantive law, *fiqh*, are the outcome of various deductive and inductive methods of reasoning. *Fiqh* rulings are dependent on the social, material, and intellectual environments of each age and polity; they comprise the temporal legislation. Thus *sharī a* is 'the plain, self-evident (*ẓāhir*), unequivocal ordinances of Quran and *Sunnah*'. *Fiqh* is 'the human understanding of *sharī'a*'.[1]

Islamic legal history antedates the Quran since Islam antedates the Quran and the Prophet Muhammad. However, for our purposes here, the genesis of Islamic law is coeval with the revelation of the first verses of the Quran in 13 AH/AD 610.[2] Islamic jurisprudence was the first science developed by the post-Quranic Muslims. Inasmuch as its norms, principles, and methodology guided, governed, encouraged, and developed Islamic civilisation, including its scientific and intellectual manifestations; they provide the guidelines for our discovery of the principles of environmental engineering systems.

History of Islamic law and civilisation

Medieval Islamic law

The Quran was revealed gradually over a period of about twenty-two years (13 BH–AH 11/AD 610–632). During this period decisions were

made primarily on the basis of the partially revealed Quran, and secondarily through 'the human, though prophetic, clarification' by the Prophet Muhammad.[3] The latter is called the *Sunnah* (lit., a way, method, or trodden path) or Prophetic Tradition, comprising what the Prophet did (*Sunnah*), what he said (*Hadith*), and what he approved implicitly or tolerated (*taqrīr*) from among the customs, usages, and traditions of the people.

The successors of the Prophet during the 'Rightly Guided Caliphate' or Islamic republican period (AH 11–41/AD 632–661), followed the Quran as the primary source of law through its liberal and unscholastic interpretation. They also followed the precedents set in the Prophet's Traditions which they had helped form, and to which they were a living witness. When the spirit of the Quran or *Sunnah*, public interest; and changes in time, place, intentions, environment, or social organisation required it, they resorted to new interpretations and innovative applications of the Quran. They would also set aside some of the *Sunnahs* of the Prophet in matters of details with regard to positive law, a principle which had been approved by the Prophet himself.[4] During this period other sources of law, such as *ijmā'*, and various nuances of *ijtihād* were also practised.

It was during the first half of the AH second/AD eighth century that the earliest systematic efforts were made to lay the foundations of a science of Islamic law. The deliberations of a private 'legislative council' in Iraq, comprising Abu Hanifa (d. AH 150/AD 767) and his pupils, provided the material for the establishment of the first widespread school of Islamic law, the Hanafi school. During the second half of the AH second/AD eighth century, two students of Abu Hanifa, Muhammad al-Shaibani and Abu Yusuf Ya'qub al-Ansari, distinguished themselves in transmitting the Hanafi school. Abu Yusuf established the Hanafi school of law in the Abbasid Empire in his capacity as Chief Justice-cum-Law Minister. This initiated the first move since the Rightly Guided Caliphs to bridge the gap between Islamic legal theory and legal practice.[5]

There were two other great jurists contemporary with Abu Hanifa. Ja'far al-Sadiq (d. AH 148/AD 765), also in Iraq, became the eponymous founder of the Imamiyyah or Ja'fari school of law. His lectures were attended by Abu Hanifa and Malik ibn Anas.[6]

Malik ibn Anas (d. AH 179/AD 795) became in Medina the founder of the Maliki school of law, or the School of Tradition (*Sunnah*). The Hanafi school in Iraq, called the School of Opinion (*ra'y, ijtihād*), made greater use of individual expert opinion and in the beginning, tended towards building a logically perfect legal system based on pure reason and scholastic subtleties. The Traditionist school of Malik, flourishing in the milieu of the Prophet's living *Sunnah* in Medina, emphasised the real case and temporal situations against the above tendency towards abstract thinking in law. However, in the beginning, the Maliki school tried to eternalise the decisions given in concrete cases in Medina.[7]

It was al-Shafi'i (d. AH 204/AD 819), who tried to integrate and

reconcile the Hanafi and Maliki schools, and became the founder of the Shafi'ī school of law. Al Shafi'i was the first to compile the sources of Islamic law. His systematic reasoning and disciplined methodology in explaining the origins of Islamic jurisprudence left their mark on the finished structure of all the classical Islamic schools of law. Among the pupils of al-Shafi'i were founders of new schools such as Ahmad ibn Hanbal (d. AH 241/AD 855), the founder of Hanbali school.

However, the greatest exponents of classical Islamic law, Ja'far al-Sadiq, Abu Hanifa, Malik, al-Shafi'i, and Ibn Hanbal, never intended to found legal schools, much less to make their opinions valid forever. These schools took their name posthumously. Most of the important differences between the legal schools did not outlive them. The students of one jurist often migrated to other provinces of the Islamic world-state, studied under jurists of another school, and a cross-fertilisation of ideas took place. Thus al-Shafi'i, a pupil of Malik in Medina, travelled in Iraq and studied with al-Shaibani of the Hanafi School of Opinion. These experiences led him to give juristic opinions which were recognised as his Iraqi or 'earlier school'. When he settled in Egypt, al-Shafi'i changed some of his legal interpretations which came to be known as his Egyptian or 'new school' interpretations. The appearance of nineteen major schools of Islamic jurisprudence during nearly 250 years, from about the middle of the AH first/AD seventh up to the beginning of the AH fourth/AD tenth century, shows further the lack of intellectual rigidity and slavish imitation among these Muslims.[8]

The history of classical Islamic jurisprudence shows how early Muslim jurists worked to meet the changing needs in each generation, polity, and geographical area through fresh *ijtihād*, within the constraints of *sharī'a*. They accepted as legitimate variations in legal decisions based on sociological factors, while reconciling their ideologically diverging views within the purview of the norms and values of the *sharī'a*. They employed deductive as well as inductive methods in legal interpretations and decisions, thus ensuring that the emerging culture was ideologically Islamic, rational, idealistic, and progressive. They crystallised the assimilative and creative spirit of Islam in terms of principles of legal methodology. The contemporary reconstruction of Muslim thought, and development of empirical socio-cultural system, require application of this idealistic rational legal methodology. This includes the ideological and scientific-technological realms of environmental engineering systems planning.

Decline of the medieval Islamic civilisation: causes and consequences

After the crystallisation of the classical schools of Islamic law, independent inquiry and innovation among Muslim jurists gradually declined from about the AH fifth/AD eleventh century. The extreme rationalism and intolerant attitudes of some Muslim jurists and philosophers created their own antithesis, a reactionary trend towards over-organisation,

traditionalism, and social and legal rigidity. The rise of Muslim scholasticism drove some acute legal minds to gnostic Sufism which is speculative and, as a form of free thought, an ally of rationalism.[9] This trend was reinforced by the recurring waves of death, destruction, and anarchy sweeping across the Muslim world during the AH sixth to eighth/AD twelfth to fourteenth centuries. These factors also contributed to the discontinuity of educational institutions and research in law, science, and learning in general.

The violent changes in the Muslim world were preceded by an internal decay of family life and moral fibre of the ruling elites due to concentration of power and wealth in the hands of a few who revelled in luxury, hedonism and sexual laxity. The national stamina was weakened by over-taxation and exploitation of the people. The martial spirit of the people and the ruling elites had departed. There was no more the rule of *sharī'a* in personal and family life, national affairs, and international relations. Political authority was not located in the sovereign *sharī'a* and a ubiquitous *fiqh*. Politics became a struggle for power through force, intrigue, assassination, and civil war. The Abbasid caliphs of Baghdad were installed and dethroned at will under the rule of Buwayhid military commanders during a century of the latters' supremacy (AH 334–450 / AD 945–1055).[10] The fall of the Umayyad dynasty of Muslim Spain in early AH fifth/AD eleventh century gave rise to petty kingdoms and internecine wars. These civil wars increased with time along with the wars for Christian reconquest of Spain. The final expulsion of Muslims from Spain in AH 1018/AD 1609 was preceded by the Inquisition, and the destruction of Muslim educational and cultural institutions.[11]

The Crusades of the AH sixth/AD twelfth and AH seventh/AD thirteenth centuries contributed heavily to the massacres of Muslims and destruction in the Eastern Muslim region.[12]

The most important cause for the decline of the medieval Islamic civilisation was the destruction of culturally important parts of what is today Soviet Central Asia, Afghanistan, Iran, Iraq, Syria, Turkey, and northern Indo-Pakistan. This was accomplished by the Mongols under Chingiz Khan and Timur Lang in three waves during the AH seventh/AD thirteenth and AH eighth/AD fourteenth centuries. Massacres in some of the great cultural centres are estimated as follows: Tirmidh, Sabziwar, Balkh, Bamiyan, Nishapur, etc., entire cities; Samarqand 1 000 000; Khwarizm 1 200 000; Merv 700 000–1 300 000; Herat 1 600 000; and Baghdad 1 800 000 in AH 656/AD 1258. The last wave of destruction begun by Timur Lang in AH 781/AD 1380 continued for about a quarter century. Timur massacred 80 000 people in Delhi, and in the second destruction of Baghdad (AH 803/AD 1401) dotted the city with 120 towers of the heads of the dead. Libraries, colleges, hospitals and mosques (which were also institutions of learning) were burnt and destroyed. Irrigated lands were converted to deserts occupied only by nomadic herdsmen and marauders.[13]

After the fall of Baghdad (AH 656/AD 1258), for over five centuries the Islamic metropolis *par excellence*, the Muslim world lapsed more and more into political anarchy and socio-cultural chaos. In the period of Syro-Egyptian history (AH 648–922/AD 1250–1517), under the Mamluk dynasties, forty-seven rulers in more than that many different reigns ruled for less than six years per ruler. At about the same time in Muslim Spain (AH 630–897/AD 1232–1492), twenty-one kings of the Nasrid dynasty ruled in twenty-eight reigns for about nine years each.[14]

The Near East was further depopulated by the Black Death of the AH eighth/AD fourteenth century, and the famines which accompanied it in two successive generations. 'In a young and vigorous society the effects of such a disaster soon disappear; but where the social order is already reeling, many decades are required before equilibrium can be regained. This respite was not granted to the Islamic world.'[15] Due to both social and natural causes, it is said that the population of Syria and Egypt was reduced by two-thirds during the Mamluk period.[16]

The vindication of *sharī'a* state and culture against these aberrations of Muslim history was the purpose of the historiography and the whole sociology of Ibn Khaldun (d. AH 808/AD 1406). In the *Prolegomena (The Muqaddimah)* to his *Universal History*, he analysed the causes for the growth and decline of cultures; their fluctuations between desert and urban, primitive and developed stages; their characteristics, and the consequences for socio-cultural institutions. In this century, Sorokin described the manifold distortions in parameters of socio-cultural growth caused by revolutionary changes.[17] If a socio-cultural system comprises three components – the ideals, or ideological culture; the empirical vehicles and instrumentalities, or the material-technological culture; and the human agents of the various socio-cultural subsystems – the devastations lasting over three centuries not only wrought disaster upon the 'vehicles' and 'human agents' of medieval Islamic civilisation, they also distorted Muslim ideals. The Muslim culture mentality was changed from the truly Islamic 'idealistic rational' or 'integrated' to the decidedly un-Islamic 'ideational' (other-worldly) culture mentality.[18] Ascetic, quietist, and almost cynical, Sufism, an example of the latter mentality, became the refuge for intelligent, morally conscious Muslims. They developed a disdain for this world and a withdrawal from the tasks and burdens of civilisation. Pessimistic Sufism turned its back on Islamic law and philosophy as well as the experimental method, two of the crowning achievements of Islamic civilisation during the centuries when it wielded cultural hegemony in the world. 'The terror, the fear, the heavy losses of material treasures and the mass murder of men of learning and wisdom stupefied and disrupted scholarship. Originality and imagination gave way to rigidity and imitation, and active urge for exploration and research gave way to despair and resignation.'[19] This atmosphere of supercharged pessimism engendered fear of further social disintegration, and lawless-

ness. The Islamic thinkers 'focused all their efforts on the one point of preserving a uniform social life for the people by a jealous exclusion of all innovations in the law of *sharī'a* as expounded by the early doctors of Islam'.[20] After the destruction of the Abbasid caliphate in mid AH seventh/AD thirteenth century, this initiated the age of 'absolute imitation' (*taqlīd maḥḍ*), of the positive law (*fiqh*) of the classical Islamic jurists. Efforts to reverse this trend did not succeed even after the birth of the successor Muslim states like the Ottoman, Safawid and Mughal empires. Until the Mongol invasion, literacy and elementary education were almost universal among the Muslims. Education and research were supported by the state, royal families, and through the dedication by individuals of public trusts and foundations.[21] Political instability and economic destruction stopped this support. The treasures of Islamic science and learning, including law, were available almost entirely in the Arabic language. What survived the Mongol holocaust was not translated into the other languages of the Muslim peoples as political power passed into the hands of non-Arab elites.

After the end of the AH fifth/AD eleventh century, the Muslim higher education system suffered a momentous qualitative distortion: domination of education by sectarian dogmatic theological instruction (that is 'the *sharī'a* sciences'), at the expense of natural and social sciences (that is the secular or 'rational/philosophic sciences'). The number of such schools of higher learning had increased remarkably in the AH sixth/AD twelfth century; only a few of them survived destruction by the Mongols in the next century.[22] Sheer ignorance of Islamic ideological culture by Muslims, the invasion of Islam by Sufi theosophy and mass religion, and consequently the rising tide of 'reprehensible innovations' (*bid'a*), in actual Muslim culture patterns strengthened the hands of Islamic conservatism. Innovations and *ijtihād* in the gamut of Islamic law and culture were aborted by conservatism, traditionalism and obscurantism entrenched in the Muslim world.

However, efforts for revival among Muslims were never given up. There was always a silver lining, and rejuvenators, in the darkest days of Muslim decline. We allude in Chapter 3, in a footnote, to revivification of Islamic civilisation at the hands of the Muslim posterity of the barbarian Turks and Mongols in the AH fifth/AD eleventh, AH seventh/AD thirteenth, and AH eighth/AD fourteenth centuries.[23]

The history of medieval Islamic civilisation brings out the importance, for socio-cultural development, of the rule of law, and political stability; investment in human capital and an infrastructure for education through public and private support, and the quality and content of education. It highlights the interdependence of material/technological and non-material/ideological factors in socio-cultural development; and the indispensability of Islamic 'idealistic rational' or 'integrated' culture mentality in contradistinction to 'ideational' and 'sensate' culture mentalities. The

Islamic answer to these requirements of development is presented in the rest of this work.

Revival of Islamic law and culture

After the gradual erosion of the form of Islamic state established by the Prophet Muhammad, and continued under the four Rightly Guided Caliphs, Islamic legal theory and practice began to diverge. Islamic constitutional theory was set aside by autocratic governments. Private 'legislative councils' such as that of Abu Hanifa did not evolve and transform permanently into a legislative assembly (*majlis al-shūrā*) where individual expert opinion would be institutionalised to arrive at representative public opinion (*ijmā'*). Though the jurists were consulted individually with deference by even the most autocratic rulers, they were relegated to playing the restricted role of advisers. Individual jurists who resorted to free *ijtihād*, exerted the claims of an independent legislative arm and judiciary vis-à-vis the palace government, and strove to subordinate the kings and their governments to the rule of the law, were often persecuted or made politically harmless through conscription in the judiciary.[24]

After the First World War, the pseudo-Islamic legal and political theory constructed and practised during over a millennium of inadmissible compromises with the *sharī'a*, was dealt a *coup de grâce*. The *sharī'a* calls for its own constitutional, representative, republican state or the caliphate (Chapter 5). The pseudo-caliphate of the Ottoman dynasty was abolished. This caused an abrupt cleavage with the medieval pseudo-Islamic legal theory and practice.[25]

Since the end of the Second World War, colonialism, overt alien political and ideological domination, and indigenous totalitarianism have suffered a setback in many Muslim countries; except areas under Communist domination. Islamic activism is rising from under the debris of gnostic and quietist Sufism. In proportion to the failure of subtle and subversive alien ideological activities as well as the success of limited Islamic intellectual revival, political democracy, constitutionalism, republicanism, and the realisation of cultural self-determination, modest progress has been achieved in rejuvenating Islamic legal theory and practice in Muslim countries.

We can identify three recent tentative probings for the Islamic modernisation of law in Muslim countries.[26] The first is limited exercise of *ijtihād* by selective assimilation: *takhayyar* ('to select' what is *khayr* or good, advantage, welfare) and *talfīq* (piecing together, patching up). According to this eclecticism, essentially a form of *taqlīd*, it has been possible to pick and choose, from among the different decisions on a particular issue, one legal opinion or precedent from the classical legal schools; and even combine the doctrines of various classical schools, and opinions of jurists, to produce an altogether different ruling. The Prophet Muhammad had

said truly: 'The differences of opinion among the learned within my community are (a sign of) God's grace.'[27]

Secondly, the Islamic state established in accordance with the *sharī'a* is vested with authority to enact legislation, adopt administrative measures, and make other policy decisions such as the choice of particular interpretations of law. These are the discretionary powers granted to the political authority. The *sharī'a* sanctioned this broad governmental authority to enable the Islamic state to be responsive to the necessities of social change, the needs of public interest, and good government. In the absence of a legislative assembly, these powers were exercised by the king or pseudo-caliph, almost always in consultation with recognised jurists. Today this function is exercised by legislative assemblies in the Muslim countries – whether or not the state and government adhere to Islamic constitutional theory and the directive principles of an ideologically committed Islamic state.

Lastly, there has been an attempt to enact new laws or give judicial rulings through fresh interpretation of the *sharī'a*, by employing the methodology of jurisprudence which the classical jurists elaborated and employed, *mutatis mutandis*. This is the position of the 'Islamic modernist' movement which seeks to restore *ijtihād*. This thesis has its roots deep in the past. The first such *ijtihādiyya* movement was started by Taqi al-Din ibn Taimiyya (AH 661–728/AD 1263–1328).[28] He was born five years after the destruction of Baghdad, coinciding with the date for alleged 'closing of the gate of *ijtihād*'. In modern times, this revolt against absolute imitation of classical jurisprudence was started in the middle of the AH thirteenth/AD nineteenth century by the *salafiyya* movement. This is the modernist or contemporary *ijtihādiyya* movement whose ideas have been adopted in this work. It advocates making a distinction between the *sharī'a* and *fiqh*; the exercise of systematic original thinking, *ijtihād* and *ijmā'*, with no claims to finality; a selective and discriminatory use of the Prophet's *Sunnah*; avoiding sectarianism; and reverting to the characteristic methodology but not necessarily to the law and solutions of the classical schools, extinct and extant.[29]

The Islamic modernists realise the dangers inherent in the first two methods discussed above: the attempts to unite the positive solutions of the classical legal schools through rather artificial and haphazard 'selection' and 'patch-up work'; and the arbitrary exercise of political powers by a Muslim state.[30]

The reconstruction of modern Islamic substantive law on *sharī'a* foundations does not necessarily imply rejection of all the achievements and experiences of classical jurisprudence. The extent to which *takhayyar* and *talfīq* have been successful in the contemporary modernisation of Islamic positive law shows how much agreement there can be with what generations of Muslim scholars deduced and applied in ages entirely different from our own in all material and social realities. Their piety and

logical consistency force our unbounded admiration even when we disagree with them. But the best tribute to the enduring quality of the classical *fiqh* heritage is the modernist admission that contemporary transformation of Muslim societies requires a 'change which starts precisely at the point where classical Islamic legal thought halted; which uses classical legal terminology, employs classical legal methodology, and examines classical legal principles'[31] to re-understand the immutable *sharī'a* sources for application as *fiqh* today. This is what we will do here, and in Chapter 4, in adopting Islamic law for environmental engineering systems planning.

Methodology of Islamic jurisprudence

The 'sources' or 'roots' of the science of Islamic law connote here the places where its rules are to be found first; and also the foundational legal concepts used as tools to derive such rules. We must bear in mind the fundamental distinctions between *sharī'a* and *fiqh*.

Sources of sharī'a

The Quran: primary source. This is the scriptural revelation of the will or laws of God and primary source of Islamic jurisprudence. The Muslims must conduct all affairs by 'that which God has revealed', otherwise they are 'wrongdoers', 'transgressors', and 'disbelievers'.[32]

The authority of the Quran is unconditionally binding and irrevocable for a Muslim. However, according to the methodology for apprehending the Quran (Chapter 1), and the nature of its subject matter which deals with value judgements and broad principles, its commands are applicable to innumerable human and social conditions with both precision and flexibility. Besides, God has provided scope for the fallibility and relativity of human understanding; for, whatever He commanded us to do is obligatory only to the extent of our ability. 'God imposes not on any soul a duty beyond its scope.'[33]

The Sunnah or Hadith (Traditions or Sayings of the Prophet Muhammad). The *Sunnah*, which is extra-Quranic, was defined earlier as comprising what the Prophet Muhammad said and did, and agreed to or tacitly tolerated from among the pre-Quranic customs and practices of the people. Most of all it is the 'model pattern of behaviour'.[34] It demonstrates how the Prophet's thoughts and deeds were grounded in the eternal verities of the Quran as well as in the realities of the social and natural environments in which he lived. The authority of the *Sunnah* springs from explicit declarations in the Quran.[35]

However, on the explicit orders of the Prophet Muhammad, his sayings (*Hadith*) were either not written down in his lifetime in order not to confuse them with the Quran, or were written down in limited cases and for particular purposes. The extant standard compilations of the *Sunnah*

were prepared over two hundred years after the death of the Prophet. The compilers had to reject as untrustworthy more than ninety per cent of the oral Traditions in circulation during their time. These facts call for great circumspection and stringent rules in the use of the available *Sunnah* texts.[36]

'We must distinguish Traditions of a purely legal import from those which are of a non-legal character.'[37] The former *Sunnahs* derive their character from the authority of Prophethood. However, even among the legal *Sunnah*, 'care must be taken to differentiate between ordinances intended by the Prophet to be valid for all times and circumstances, and ordinances which were obviously meant to meet the needs of a particular occasion or time.'[38]

The non-legal *Sunnahs*, which may be construed as not binding, concern non-revelatory matters, and pertain to subjects or issues in which the Prophet had a generalist's or a specialist's interest. As mentioned often in the Quran, in such matters the prophet was just another man subject to human limitations of power and knowledge, and was a part of the social and physical environment of his time. The biography of the Prophet leaves no doubt that he and his companions made a clear distinction between his rulings as the Prophet, and his decisions in his capacity as the supreme legislator, administrator, judge, and commander-in-chief. In the latter instances the Prophet used to consult and follow the functional and technical experts.[39] Once when his conjectures on a question of agricultural science were proved wrong, he accepted the facts of experience and reportedly said: 'I am but a human being. Only when I order something regarding your religious duties will you have to abide by it. But if I issue an instruction upon my personal opinion, then it is a mere guess and I am only a human being. Rather, you may better know your worldly affairs.'[40]

Thus in matters outside the purview of prophethood, there is no 'legal, binding *Sunnah*'. To the extent that there does exist a *Sunnah*, it might be reinterpreted, modified, or set aside by the dictates of subsequent progress in science and technology, and the changes in the social and physical environments. This will be in full conformity with the explicit sayings and practice of the Prophet. This is what the eponymous founders of the classical legal schools did while preserving the permanent or higher values and terminal goals of the *sharī'a* (see Chapter 4). Ibn Khaldun was to reiterate this same truth when he wrote in the AH eighth/AD fourteenth century that the Prophet Muhammad was sent to teach us the *sharī'a*, for example, the medicine recorded in the *Sunnah* was the traditional Bedouin medicine. The Prophet was not sent to teach us definitive medicine (see Chapter 7).

Fundamental principles of sharī'a*: primary sources of* fiqh

The most basic method of understanding the *sharī'a* is *ijtihād*. The various sources or methods of jurisprudence are different technical forms

or expressions of this basic idea of *ijtihād*; these are called *qiyās* (analogy), *istiḥsān* (preference) and *istiṣlāḥ* (public interest). *Ijtihād* or 'striving hard' must have originated from such Quranic verses: 'Those who strive hard for Us, We shall guide them in Our paths.'[41] In a technical sense *ijtihād* means 'to exert with a view to form an independent judgement on a legal question'.[42] It has been described variously as 'systematic original thinking'; 'individual reasoning'; 'private expert opinion'; 'independent reasoning'; 'interpretation', 'disciplined striving (to understand the meaning of the Quran and *Sunnah* for a given situation)'; and more forcefully as 'the principle of movement in the structure of Islam'.[43]

Ijtihād. It is the opposite of *taqlīd*, for example, imitation of the positive solutions of the classical Islamic jurists.

Qiyās (analogical reasoning). Literally *qiyās* means measuring or comparing. According to the *qiyās* method, the cause (*'illa*, motive or *ratio decidendi*), for the rules or legal maxims derived from the *sharī'a* sources is ascertained; and the same rule is applied to new problems on the basis of similarity of the cause of the original and the new problem.[44]

According to al-Shafi'i (d. AH 204/AD 819), the most influential jurist of the finished structure of Islamic classical law, *ijtihād* and *qiyās* are two terms with the same meaning.[45]

We brought out in Chapter 1 the emphasis in Quranic epistemology on the concordance between the *āyāt* of the Quran and the *āyāt* of God in the objective, external world comprising the phenomena of nature and the processes of history. These are the sources of deductive *qiyās* (analogical deduction) and inductive *qiyās* (analogical induction), respectively. Full recognition must be given to both forms. Inductive *qiyās*, based on the physical or natural facts and sociological data, must be fully developed as a link between the objective, external world and the subjective deductions from the scriptural revelation.[46]

Tensions arise between the conclusions reached by deductive and inductive *qiyās* because scriptural revelation is an immutable source of knowledge whereas our understanding of the objective, external world is inconclusive. The inductive or scientific method applied to natural and social sciences is an interminable process. These tensions become resolvable when we acknowledge that *fiqh*, the 'understanding' of *sharī'a*, is also an interminable process with inconclusive results. The external world of man and nature is an immutable source of revelation of the will of God, while its understanding by us is an interminable process with inconclusive results. It is the function of *qiyās*, or *ijtihād* in general, to harmonise any discord that may come between the solutions suggested by deductive and inductive *qiyās*. This is a creative tension which must be accepted as an interminable challenge. (See Ibn Rushd, Chapter 3)

During the interim period of conflict, while we exert ourselves to arrive at concord between the two forms of *qiyās*, we must follow the conclusions of deductive *qiyās* in preference to those of inductive *qiyās*[47] in the

realm of values. On the other hand, the conclusions of inductive reason must be preferred in matters of objective facts. The opinions arrived at deductively from scriptural revelation must be brought into conformity with the facts obtained inductively from natural and social sciences.

Ijmā' (consensus). *Ijmā'* means agreement or general consent. *Ijmā'* is collective, organised *qiyās* or *ijtihād*. Recourse to *ijmā'* is based on the authority of *sharī'a* ordinances. However, the *sharī'a* does not provide an unequivocal rule on whether *ijmā'* refers to the decision of the competent or of the community at large; the relation between the two; and whether it has to be a unanimous decision, the decision of a simple plurality or of a preponderant majority.[48] These questions must be decided by *ijtihād* and *ijmā'*. However, there can be no better endorsement of the principles of government by consultation, and decision-making by a simple majority on most issues than the Prophet's statement to Abu Bakr and 'Umar, who were to become the first two Rightly Guided Caliphs: 'If you two agree on a counsel I shall not dissent from you.'[49]

In compliance with the Quran, the Prophet Muhammad used to consult with his companions and defer to their expert opinions in legal, technical, political, and even 'religious' issues like the form and wording of the call for prayer (*adhān*).[50] The Rightly Guided Caliphs also used to ascertain and employ *ijmā'* for legislative and political decision-making.[51] Later on in juridical matters *ijmā'* used to evolve slowly and retrospectively. Conflicting opinions of scholars would be debated among them, compromises and reconciliations would be offered, and it would be found retrospectively that the community had gradually accepted a particular legal interpretation. This was the *ijmā'* of the community.[52]

In our times, *ijmā'* must take the form of decision-making through advice and consent (*shūrā*) at all levels of governmental activity. Continuous, temporal legislative and political decisions must be made by *ijmā'* in a *majlis al-shūrā* in accordance with a *sharī'a* constitution and *sharī'a* legal codes of its own making. People capable of exercising *ijtihād* must be elected through popular consent.[53]

Ijmā' is probably the most important Islamic legal principle. Without the sanction of *ijmā'*, interpretations of *sharī'a* through *ijtihād* in its various forms would remain *zann*, personal conjecture. *Ijmā'* bestows legitimacy and the force of law on *ijtihād* by mitigating its subjective liability to error. The *ijmā'* of earlier generations is binding on the following generations only in matters of fact which the previous generations alone were in a position to know. Thus, the *ijmā'* of the classical schools is not final. *Ijmā'* in legal and other matters is binding only for the generation that formulates it, until they or later generations replace one *ijmā'* decision by another. *Ijmā'* cannot abrogate the *sharī'a* sources.[54]

Fundamental principles of sharī'a*: secondary sources of* fiqh

If *ijtihād* or *qiyās* is the basic legal method of individual reasoning, deductive and inductive, several subsidiary methods can be looked upon

as special forms of *ijtihād*. Their origin and sanction can be traced back to the Quran, and the sayings or practice of the Prophet. Hence, they are principles of *sharī'a*. All these subsidiary methods purport to study the causes behind the rules, and to realise the letter and spirit of the *sharī'a* by fulfilling the interests of people in their social life through equity, justice, and kindness. These methods help us in superimposing Islamic values and principles on aspects of culture which God deliberately left outside the purview of direct *sharī'a* ordinances. Such interests and activities of man cannot violate the letter and spirit of the *sharī'a*, and they will not as long as the needs and aspirations of men, state, and society, which they purport to facilitate, are rooted in the real nature of man created by God.[55] Some of the more important principles of *sharī'a* are discussed below.[56]

Pre-Quranic revelations. Islam is not a new religion, nor was it a complete break with the past. Rather the Quran was sent down to confirm what was Islamically valid in the previous scriptures, and to improve and reform the laws and traditions attributed to the Prophets before Muhammad in conformity with the letter and spirit of the Quran (Chapter 1). Thus after naming at one point eighteen earlier prophets who had been given similarly 'the Book and the authority and the Prophethood', God commands the Prophet Muhammad and the Muslims: 'These are they whom God guided; so follow their guidance', for the Quran is 'nothing but a reminder to the nations'.[57]

Thus the laws of the people possessing a previously revealed divine book – *Sunan man kānā qablakum*, lit., 'the traditions of the people before you' – are considered valid and applicable to Muslims except to the extent that they were abrogated or amended by the Quran or the *Sunnah* of the Prophet Muhammad. In the absence of any express revelations of the Quran, particularly when the Quran was being revealed gradually, the Prophet Muhammad used to follow the laws and customs attributed to the Prophets Moses, Jesus, and others, in preference to those of pagan Arabs. However, the increase with time in the corpus of Quranic verses, and in view of the charges of corruption in the previous scriptures, recognition in Islam of the laws of the previous prophets was confined to those specifically mentioned in the Quran or to customs and usages approved by the Prophet.

Some of the confusion created by this source of law is very serious and instructive. The punishment for adultery prescribed in Jewish law was stoning to death. The Prophet Muhammad followed this law apparently only until flogging was prescribed in the Quran. Nevertheless, classical Muslim jurisprudence mistakenly and wrongly prescribed death by stoning for adulterers, restricting for fornication the Quranic 'limit of punishment'(*ḥadd*) by flogging. The zealot imitators (*taqlīdiyyūn*) of our times are constrained by their anti-*ijtihādiyya* premises to support this pseudo-Islamic custom much to the chagrin of Islamic revivalists.[58]

The full impact of this source of Islamic law was to be felt in assimila-

tion through cross-cultural borrowing of what was considered to be ideologically 'neutral' in the natural and social sciences, that is, the material and technological aspects of culture and its value – free vehicles and institutions (Chapters 3 and 7). In the realms of human and international relations, the Muslims were to become and remain in history the non-racist, non-xenophobic, appreciative and catholic peoples *par excellence.*

Istiḥsān (preference for the better). *Istiḥsān*, means 'regarding as better', 'to prefer, or to consider a thing commendable'. This legal method was developed by the school of Abu Hanifa as a doctrine of equity when they realised that literal application of *qiyās* failed in certain cases to achieve the overall aims of the *sharī'a.*[59] As discussed below *istislāḥ* is a similar legal principle developed with the same aims and to satisfy the same felt needs by the traditionist school of Malik. The eclectic methods of *takhayyar* and *talfīq* as methods used to harmonise legal decisions with contemporary social needs, might be considered aspects of *istiḥsān.*

Istiḥsān as a foundational legal concept owes its origin to explicit Quranic texts. 'Give good tidings to My bondmen who hear advice and follow the best (*aḥsan*) thereof.' 'And [he who] accepts what is good (*ḥusn*), We facilitate for him ease . . . And [he who] rejects what is good, We facilitate for him distress.' 'And follow the best (*aḥsan*) of what has been revealed to you from your Lord.'[60]

Applications of *istiḥsān* include giving juristic preference to the stronger bases of law over the weaker. *Sharī'a* rulings are ranked higher than *fiqh* rulings. Dictates of purely logical and literal applications of *qiyās* to some *sharī'a* sources could be set aside in favour of the other, and to realise the spirit of *sharī'a* on the plea of equity, necessity, public interest and mitigation of hardships.

Cutting off a limb of a thief is the severest possible or the limit (*hadd*) of punishment prescribed in the Quran. But God also enjoins in the Quran social and economic justice, leniency in hardship, gradualism, education through instruction and example, reform through repentance and retribution through application of sanctions. All these *sharī'a* values and goals are valid and obligatory. When various types of unemployment exist for economic and technological reasons, or cultural causes such as discrimination, this limit of punishment for thievery will remain suspended in order to realise other *sharī'a* goals and values.[61] This illustrates the methodology of axiological systematisation of Islamic values (Chapter 1) and *istiḥsān.*

Istiṣlāḥ or al-Maṣlaḥa (public interest). The Quran is basically a book of guidance, moral principles, and exhortations. It is not an exhaustive legal code. The explicit legal ordinances contained in the Quran and the binding *Sunnah* are deliberately few.[62] *Ijtihād* has the widest scope of action in matters dealing with social transactions in contradistinction to the rules and rituals of worship. Some of these transactions or human

affairs are outside the purview of explicit texts of the *sharī'a*. They are *mursal* or 'set loose' from such texts. The intent of the values of the *sharī'a* is satisfied when these everyday activities or transactions are conducted for the enjoyment and facilitation of life, and the benefit of the people so as to further public weal or common interest, *al-maṣlaḥa*. This is the principle of *istiṣlāḥ*, that is, the striving for what is in the general interest. It was first systematised by Malik ibn Anas. The method of argument, scope, and purpose of *istiṣlāḥ* are identical to those of *istiḥsān*. The two doctrines are often considered identical.[63]

'Urf, 'Ādah, T'āmul (customs and usages). In conformity with the oft-repeated Quranic philosophy that all things good and beneficial, regardless of their source, are lawful for Muslims,[64] the Prophet Muhammad had absorbed into Islamic culture many pre-Quranic customs, usages, conventions, and habits. He also reportedly said: 'The virtues of the days of ignorance (the pre-Quranic times) will be acted upon in Islam'. 'A wise counsel is the lost property of the Faithful; wherever he discovers it, he takes hold of it.'[65] Thus the customs and laws of pre-Quranic Arabia, and those of the countries conquered and inhabited by Muslims have become another source of Islamic jurisprudence within the constraints of the *sharī'a*. The classical jurists, particularly of those legal schools which were developed outside Medina, held the view that in the absence of a binding ordinance of the *sharī'a*, it is the custom of the place and epoch that prevails and not the conclusions of rigorous analogical deduction (*qiyās*).[66]

Foreign Sources of Fiqh. Our discussion of Quranic epistemology in Chapter 1 brought out the emphasis on learning from past and present experiences of mankind, and the laws of history or sociological forces as the *āyāt* of God. Muslims did learn in the past, and must do so today, from the laws and cultural heritage of other peoples and nations: by comparative studies: by vying with other peoples in the pursuit of excellence; and by adopting and assimilating the discoveries and inventions made by other peoples. 'It is the basic outlook of *sharī'a* that it transcends all false barriers of man-made schisms and narrow-mindedness.'[67] God defined the cultural mission of Prophet Muhammad: 'He (the Prophet) enjoins them good and forbids them evil, and makes lawful to them the good things and prohibits for them the bad things, and removes from them their burden and the shackles which were on them.'[68]

This source of Islamic law is based on a maxim derived from Quranic verses: *Al-asl al-ibaḥah*, that is, all that is not forbidden by *sharī'a* is permissible by presumption.[69] This and similar doctrines encourage the perpetual infiltration of beneficial foreign influences into Muslim culture as long as they do not violate the *sharī'a*.

Leniency (taysīr) *under compulsion or constraint* (iḍtirār), *or in dire necessity* (ḍarūra) Treaty obligations, agreements, armistice clauses, commercial contracts, etc., undertaken by an Islamic state with foreign

nations and international organisations might violate some *sharī'a* injunctions. The Treaty of Hudaibiyya concluded by the Prophet Muhammad was partly unfavourable for the immediate interests of the Muslims and the Islamic state. Such compromises and violations of the *sharī'a* are permitted when, and only so long as, the Islamic state or particular Muslims are under extreme stress (*iḍtirār*) and in unavoidable necessity (*ḍarūra*).[70] Such dire necessity, hardship and compulsion might be in private or public matters, in internal or international law. 'Whoever is driven by necessity, not desiring, nor exceeding the limit, no sin is upon him'[71] in such circumstances, to violate the clear ordinances of the *sharī'a*. For 'God desires ease for you, and He desires not hardship for you.'[72] This enunciates another *sharī'a* principle of leniency, facilitation or making things easy (*taysīr*), when it is feared that a relentless application of general rules to certain exceptional cases will result in injury and hardship. These concepts are part of the general principle of public interest (*istiṣlāḥ* and *istiḥsān*).

The spirit and scope of *sharī'a* and *fiqh*

We have made a clear distinction between *sharī'a* and *fiqh*. The *sharī'a* comprises the Quran, and the 'legal, binding *Sunnah*'. The Quran and *Sunnah* are distinct and demand a Muslim's loyalty at different levels of meaning and ethico-legal compliance. The Quran also partly comprises ethical exhortations which are legally unenforceable; that is why Muslim jurists often make a distinction between 'rules of piety' and matters of 'law'. By and large, the Quranic legal ordinances are broadly-based ethico-legal rules which establish general principles rather than specific details. The recorded *Sunnahs*, on the other hand, vary in the degree of reliability and authenticity. Even among the authentic *Sunnahs*, only those which have a timeless import as well as a legal bearing will be considered the 'legal, binding *Sunnah*'. These and similar considerations make most of the *sharī'a* ordinances flexible, conducive to varying valid interpretations, and adaptable to the changing social needs and exigencies in any time-space context.

Fiqh comprises the derived or substantive legal rulings. *Fiqh* is temporal, man-made, and subject to sociological determinants. *Ijtihād* is the inalienable right of each Muslim in proportion to his capacities and responsibilities. Unless approved as an *ijmā'* ruling or legislation, *ijtihād* has only the authority of *zann*, or personal, fallible opinion. *Fiqh* became partly rigid and stagnant after the second half of the AH fourth/AD tenth century, and more so after the middle of the AH seventh/AD thirteenth century. After the Prophet Muhammad and the Rightly Guided Caliphs, *sharī'a* constitutional and economic theories became, more or less, arrested institutions. The distinction between *sharī'a* and *fiqh* and the divergence between their implementation, are due also to the fact that

Islam is an aspiration rather than an achievement, a state of becoming rather than a condition of being.

The entire superstructure of Islamic law could be considered founded on the oft-repeated Quranic dictums: 'enjoining what is right and forbidding what is wrong', and 'making lawful for mankind the good things and prohibiting for them the foul things.'[73] To underline this basic philosophy of the *sharī'a* and the *fiqh*, and to delimit their respective scope, Muslim jurists have made a five-part division of the mandatory legal rules. In the words of Ibn Hazm of Muslim Spain (d. AH 456/AD 1064):

> 'The *sharī'a* in its entirety refers either to obligatory acts (*farḍ*), the omission of which constitutes a sin; or to forbidden acts (*ḥarām*), the commission of which constitutes a sin; or to allowed acts (*mubāḥ*), the commission or omission of which does not make a man a sinner. Now these permissible acts (*mubāḥ*) are of three kinds: first, acts which have been recommended (*mandūb*) – meaning that there is merit in doing them, but no sin in omitting them; second, acts which are undesirable (*makrūh*) – meaning that there is merit in abstaining from them, but no sin in committing them; and third, acts which have been left unspecified (*muṭlaq*) – being neither meritorious nor sinful whether committed or omitted.'[74]

Thus the '*sharī'a* concerns itself exclusively with what the Law-Giver has ordained in unmistakable terms' as *farḍ* or *ḥarām*; 'whereas the far larger area of things and activities which the Law-Giver has left unspecified . . . must be regarded as *mubāḥ* from the *sharī'a* point of view.' The field of activity of the Muslim community's temporal, changeable legislation, *fiqh*, comprises: '(1) details in cases and situations where the *sharī'a* provides a general principle but no detailed ruling, and (2) principles and details with regard to matters which are *mubāḥ*, that is, not covered by *shar'ī* laws at all'.[75]

God in His Quran has repeatedly forbidden any arbitrary enlargement or constriction of the jurisdictions of *sharī'a* and *fiqh*.

Implications of the sources of *sharī'a* and *fiqh* for development strategies: imitative-innovative assimilation

The explicit texts of the *sharī'a*, and their understanding and application in classical and contemporary *fiqh*, show that innovation, imitation, and assimilation in Islamic culture of anything of value or utility is permissible, regardless of its origin. The only condition is that these borrowings and innovations should not violate the *farḍ-ḥarām sharī'a* categories. A basic message of the Quran and the mission of the Prophet Muhammad, systematised as the principles of *sharī'a*; is to guide Muslims in carrying on a triadic mission for the development of civilisation, subject to conformity with the letter and spirit of *sharī'a*:

1 to invent and innovate, making new departures on the basis of what had been revealed in the Quran, nature, and history;
2 to reform, improve, and adapt; to synthesise and eclecticise; and assimilate into Islamic civilisation what is found in the accumulating heritage of mankind (Muslims and non-Muslims);
3 to assimilate through enlightened imitation (*taqlīd*), with little or no change, whatever of value is found in the accumulating heritage of mankind, Muslims and non-Muslims.

Aside from the Quran, all the other legal methods of the *sharī'a* and *fiqh* are instruments and strategies for the achievement of these aims and objectives. A part of the *Sunnah*, and most of the conclusions of *qiyās*, *istiḥsān* and *istiṣlāḥ* are matters of originality and innovation. The laws and traditions derived from previous scriptural revelations and prophets; customs and usages of different peoples and nations; foreign sources; the conclusions of some of the other sources of *fiqh*; and part of the *Sunnah* comprising the *taqrīr* pre-Quranic customs and practices – all these are partly imitative and eclectic, and partly techniques of adaption in Islamic culture after reforms and amendments.

Despite suggestions to the contrary,[76] the contemporary 'predicament' of the Muslim world does not resemble the situation that prevailed during the AH first and second/AD seventh and eighth centuries. History of the post-Quranic Muslims during the last fourteen centuries gives a new dimension to the strategy of social development through imitative-innovative assimilation. Muslims must perform the same operation of selective absorption on the accumulated heritage of Muslim civilisation: reform, amend, adapt, and then assimilate this Islamic heritage, wherever possible, with little or no change. The two fundamental ideas taught in the Quran regarding the nature of life and time are:

1 the unity of human origin;
2 a keen sense of the reality of time, and the concept of life as a continuous movement in time.[77]

'The teaching of the Quran that life is a process of progressive creation necessitates that each generation, guided but unhampered by the work of its predecessors, should be permitted to solve its own problems.'[78]

The discussion in this chapter has been in the legal context, but the distinctions between *sharī'a* and *fiqh*, and the triadic mission of continuous imitative-innovative assimilation in Islamic culture apply to both the humanistic-social sciences and scientific-technological realms of environmental engineering systems planning, and all elements of the socio-cultural system or civilisation in general.

3 Islamic philosophy of knowledge and education: classification and outline of environmental engineering systems planning education

Introduction

The strategy of development dictated by the fundamental principles of *sharī'a* and *fiqh* calls for imitative-innovative assimilation into contemporary Muslim culture of the accumulated Islamic heritage of the post-Quranic Muslims (Chapter 2). Consequently, certain characteristics of the Islamic philosophy of knowledge and education are summarised from the writings of two medieval Islamic scholars. This philosophy is called 'Islamic' rather than merely 'Muslim' to distinguish its ideal and ideological character from its actual 'Muslim' character in the sociological-anthropological sense. Since ideal Islam and *sharī'a* are not the product of a social convention or consensus of the community called 'Muslims', we need to continuously reaffirm the Islamic quality of ideas and institutions developed at higher moments of consciousness of Islam. This is what distinguishes dynamic adaption ordained by *sharī'a* from blind imitation. We must also isolate the sociologically ephemeral from those ideas and institutions in the Islamic philosophy of knowledge and education which attain a measure of permanence and universality. The distinctions between *sharī'a* and *fiqh* are applicable to all elements of Islamic ideological and material culture. Permanent, usually Islamic, *sharī'a*-type epistemological categories are identified. These are used in the classification of disciplines comprising environmental engineering systems, and in preparing an outline of Islamic engineering education.

One of the earliest Muslim attempts to classify the sciences was made by al-Kindi in the AH third/AD ninth century. The most influential early classification of knowledge was made by al-Farabi (d. AH 339/AD 950). Al-Farabi's classification was adopted, with minor changes, by Ibn Sina (in Latin, Avicenna, d. AH 428/AD 1037); al-Ghazali (d. AH 505/AD 1111); and Ibn Rushd (in Latin, Averroes, d. AH 595/AD 1198). However, with the development of knowledge and crystallisation of medieval Islamic civilisation, the most complete and detailed descriptions and classifications of the sciences were presented by Islamic scholars of the AH eight to eleventh/AD fourteenth to seventeenth centuries. One of these latter scholars is Ibn Khaldun (d. AH808/AD1406).

We shall highlight the fundamental distinctions made by al-Ghazali and Ibn Khaldun in their classification of knowledge; the delimitation of the various sciences, and their relation to *sharī'a*; and the purpose and

hierarchy of the sciences. Since there is a basic identity in the views of al-Ghazali and Ibn Khaldun, we shall emphasise their distinct contributions. We shall then bring out the implications of these normative Islamic classifications and critiques of knowledge for engineering education, and for classification of disciplines comprising environmental engineering systems planning. While our frame of reference is the ideal pattern of Islamic culture from the point of view of developing Muslim nations, we believe our conclusions should be studied objectively from the perspectives, in general, of all the developing countries in Asia, Africa and Latin America.

We shall hereafter use a few terms in their medieval connotation. The 'philosophical" (*falsafiyya*) or rational (*'aqliyya*) sciences comprise the natural or physical, the mathematical, and the social and humanistic sciences whose primary source is natural reason. The sciences whose primary source is scriptural revelation are the *shar'iyya* (basically Islamic legal) sciences.[1] In modern parlance, 'philosophers' pursue the natural and social sciences, and the humanities, excluding the *shar'iyya* sciences. The word science (*'ilm*, plural *'ulūm*) is often used in a general sense to mean knowledge or a discipline, whether it be a social or natural science, art or craft, science or technology. However, the *shar'iyya* sciences actually encompass all pure and applied, natural and social sciences, partially or completely; subject to the influence of Islamic law, ethics, metaphysics, cosmology, autology or value-judgements.

Islamic philosophy of knowledge and education according to al-Ghazali (AH 450–505/AD 1058–1111)

Abu Hamid Muhammad al-Ghazali, born near modern Meshhed, Iran, was a prolific writer and professor in the Nizamiyya Academy at Baghdad. He is considered to have had one of the most original and encyclopaedic minds, and to have been one of the most influential thinkers of the world, of all times. The works of al-Ghazali are one of the principal sources of diffusion of Islamic culture in the medieval West. Most of his works had been translated into Latin less than forty years after his death.[2] Due to his preoccupation with morality and ethics, al-Ghazali has become such a universal figure that the medieval Jews saw him as 'actually to be drifting toward Judaism',[3] while a modern 'Protestant missionary considers him the Moslem nearest to being a Christian and recommends use of his writings as schoolbooks to lead Moslems to Christ'.[4]

Classification of knowledge

Al-Ghazali's classification of knowledge might be analysed on the basis of three criteria.

Classification of knowledge by level of obligatoriness:

1 Individually requisite (*farḍ 'ayn*) knowledge. Its acquisition is a *sharī'a* duty (*farḍ*) of every Muslim. It starts with knowledge of the

'five pillars' of Islam as and when these duties become incumbent upon the individual: confession of faith; the daily prayers; fasting in the month of Ramadan; payment of taxes (*zakāt*), and pilgrimage to Mecca. It is also compulsory for every individual to learn about:

(i) other ideas and actions permitted or prohibited in Islamic law;
(ii) the beliefs and actions of the 'states of the heart'.

'Ilm al-mu'āmalāt (knowledge of transactions), traditionally deals with Islamic civil law. But al-Ghazali identified this with 'the science of the states of the heart' or Islamic ethics. This science enjoins praiseworthy values, and forbids disvalues considered blameworthy by *sharī'a* personal morality and social ethics. These were exemplified in the lives of historic Islamic personalities. The praiseworthy 'states of the heart' include the fear of and hope in God, fortitude, devotion, generosity, truthfulness, morality and obedience to law or God's commands under all circumstances. The blameworthy impulses are all the evils and disvalues such as envy, bitterness, niggardliness, fear of poverty, desire to be praised, exalting the rich and despising the poor, holding oneself above truth, neglecting one's faults by concentrating on others' shortcomings, open friendship and secret enmity, and taking advantage of God's patience by persistently denying men their God-given rights. He called such qualities of the heart or character traits 'the seed-beds of immoralities and the nursery-gardens of turpitudes'. Al-Ghazali returned to these ethical problems over and over again since, he complained, they had been 'neglected by all'. He waged an indefatigable crusade to rehabilitate the 'science of the states of the heart', or what we might call a crusade for moral rearmament. Since this is the way to find paradise and avoid hell, al-Ghazali also called it the 'science of the hereafter'. He made its inculcation in beliefs and actions, 'to the limit of thoroughness', every individual's life-long duty.[5]

'Ilm al-mukāshafa (science of revelation), is the esoteric science of transcendental mysteries mentioned in the Quran like angels, attributes of God and prophecy. The minimum required of all people is belief in these mysteries whose real knowledge is given only to Prophets and 'those close to God'. It is beyond the grasp of even theologians and 'philosophers'; 'for this reason people should be deterred from delving into these mysteries, and instead, be diverted to pursue those subjects which the [Islamic] law allows.'[6]

2 Socially requisite (*farḍ kifāya*) knowledge. It is *farḍ* for the Muslim community as a whole. Only the requisite (*kifāya*) number of competent people should specialise in each of the required disciplines and vocations. These 'comprise every science which is indispensable for the welfare of this world'; without them 'a community would be reduced to narrow straits.'[7] They are agriculture, jurisprudence, medicine, politics and crafts. This knowledge is further classified into

the *shar'iyya* and the non-*shar'iyya* sciences based on whether or not their primary source is the revealed law.

Classification of knowledge by source:[8]

1 *Shar'iyya* sciences (*'ulūm shar'iyya*). These are the sciences dealing with the *sharī'a*. They are acquired from the Prophets and are not arrived at either by reason, like arithmetic, or by experimentation, like medicine, or by hearing, like language'.

The first of these sciences deals with the primary and secondary sources of the *sharī'a* (Chapter 2). The *furū* (branches) sciences are derived from the *sharī'a* sources through rational processes. These are:

(i) in the *fiqh*;
(ii) 'the science of the states of the heart'.

Muquddimāt (auxiliary) sciences like Arabic linguistics 'act as the instrument for the *sharī'a* sciences'.

Mutammimāt (supplementary), sciences are also related to the study of the primary sources of the *sharī'a*. Thus the principles or sources of *sharī'a* is one of the supplementary sciences in relation to the study of the Quran.

We may say, therefore, that al-Ghazali's *shar'iyya* sciences include the rational or non-*shar'iyya* sciences which are needed for a deductive understanding of the *sharī'a*.

2 Non-*shar'iyya* sciences (*'ulūm ghayr shar'iyya*). The primary sources of the non-*shar'iyya* sciences are reason, experimentation, and acculturation. The permissible (*mubāḥ*) sciences are those which are not explicitly forbidden by the *sharī'a* and, therefore, are *prima facie* lawful. Such are all the rational or 'philosophical' sciences.

Classification of knowledge by social function:[9]

1 Praiseworthy (*maḥmūd*) sciences. These are the useful and indispensable sciences 'on whose knowledge the activities of this life depend such as medicine and arithmetic'.
2 Blameworthy (*madhmūm*) sciences. These include magic, talismans, dialectical theology, astrology and the like.

Blameworthy and praiseworthy sciences: criteria[10]

Al-Ghazali describes at the outset the value and excellence of knowledge. Knowledge 'is seeing things as they really are, which is one of the attributes of God. Now, then,' asks al-Ghazali, 'could a thing be knowledge and at the same time be blameworthy?' There are two main reasons why knowledge could become blameworthy.

First, 'knowledge is not held to be blameworthy in itself' but its social role makes it so. These are the sciences blameworthy for sociological reasons. Knowledge, far from being enjoyed as an end in itself, must be

instrumental to some higher,ultimate goals. All the sciences, *farḍ 'ayn* or *kifāya*, whether their primary source is scriptural revelation or reason, are in danger of becoming blameworthy, if they do not serve their ultimate purpose or if they become dysfunctional.

Second, particular sciences, or particular doctrines of specific sciences as propounded by certain 'philosophers' are blameworthy if they conflict with the *sharī'a* doctrines and purposes. These sciences are blameworthy for ideological reasons.

Sciences blameworthy for sociological reasons.[11] Knowledge could become blameworthy on the basis of at least three criteria: harm to individuals, lack of social utility, or for not serving best the public interest; also if it is epistemologically a pseudo-science. Thus a science becomes blameworthy:

1 When it 'leads to any harm, whether the harm should befall its practicer or someone else besides', as in the case of magic and talismans.
2 When it is 'harmful to most people' and is not genuinely a science. Such is astrology which is 'purely guesswork and in the opinion of the average man, is not determined either with certainty or even with probability'. It is 'blameworthy because of this ignorance, not because it is knowledge.'

   Al-Ghazali, like his other Muslim forerunners, believed in Islamic philosophical scepticism and probabilistic science. He approved of meteorological predictions as a science founded on the empirical knowledge of the 'man who is moved to say, whenever he sees the clouds gathering and rising from the mountain tops, that there will be rain today'.
3 When it is of 'no use at all' and is, 'at its best, an intrusion into useless things and a waste of time and life which is man's most precious belonging'. Such are genealogy, and the art of poetry devoted to glorification of one's own and the ancestors' sexual exploits, raids and vendettas. These were the two most popular obsessions of pre-Quranic Arabia. The Prophet Muhammad had said about them: '(Their) knowledge avails not and (their) ignorance . . . harms not'.
4 When it 'does not give the practitioner any real scientific advantage. Consequently, such knowledge is intrinsically blameworthy, as, for example, the study of the trivial sciences before the important ones, and the obscure before the significant.'

On the basis of these criteria of social ethics, it is most significant that al-Ghazali, whom posterity was to remember as the exponent and reviver *par excellence* of Islam, launched a vehement criticism of his contemporary jurists, lawyers, and students of the *sharī'a* and *fiqh*. They had neglected development of the Islamic social ethics of science so that higher education became a tool to gratify egotistic lust for wealth and power. They had also ignored other socially requisite sciences like

medicine since it was not politically and economically as advantageous to the specialist as Islamic law. Despite a shortage of Muslim doctors they had kept themselves busy in their scholasticism and wranglings on obscure points of Islamic law which had no social use or need.

Sciences blameworthy for sharī'a *reasons: Al-Ghazali's critique and Ibn Rushd's defence of 'philosophers'.*[12] Al-Ghazali is best known as an Islamic epistemologist for his selective refutation of the 'philosophers' on ideological grounds. The 'philosophers' whom he refuted fall in three groups:

1 The materialists (*dahriyyūn*), are atheists who deny the existence of God and postulate the eternity and autogenesis of the world.
2 The naturalists or deists (*ṭabī'iyyūn*), conduct 'manifold researches into the world of nature and the marvels of animals and plants. . . . They see there sufficient wonders of God's creation and the inventions of His wisdom to compel them to acknowledge a wise Creator.' But they deny existence of the Day of Judgement, resurrection, and life in the hereafter. 'There does not remain, they hold, any reward for obedience [to God] or any punishment for sin. With the curb removed they give way to bestial indulgence of their appetites.'
3 The theists (*ilāhiyyūn*), are the Greek philosophers like Socrates, Plato, and Aristotle. They refuted the materialists and the naturalists 'so effectively that others were relieved of the task'. Aristotle rightly criticised the preceding theists including Socrates and Plato. Nevertheless, from al-Ghazali's Islamic viewpoint, 'he too retained a residue of their unbelief and heresy from which he did not manage to free himself'.

The 'philosophy' of Aristotle as transmitted by his translators, and the Muslim commentators al-Farabi and Ibn Sina in particular, falls under three heads:

(i) what must be counted as unbelief (*kufr*), and
(ii) heresy in Islam; and
(iii) 'what is not to be denied at all'.

The 'philosophical' sciences might be divided into six categories. (1) Mathematical sciences and (2) logic. Nothing in them is relevant to *sharī'a* matters 'either to deny or affirm them'. (3) Natural sciences or 'physics'. These sciences are also *mubāḥ* and *maḥmūd* like the two above except with regard to the twenty major errors of 'philosophers' pointed out by al-Ghazali. (4) Theology or metaphysics. 'Here occur most of the errors of the philosophers' because they are 'unable to satisfy the conditions of proof they lay down in logic'. The praiseworthy aspects of this science are already dealt with in the Quran and *Sunnah*; 'whatever evidence is not contained therein is either reprehensible argumentation or mere wrangling.' (5) Politics, including economics, and (6) ethics. Since these sciences were based in the Islamic civilisation on the scriptures revealed through Prophets and the teachings of pious men,

al-Ghazali considered them praiseworthy. He warned people to beware of the distortions introduced in them by the 'philosophers'.

Al-Ghazali wrote the *Tahāfut al-Falāsifa* (*The Incoherence of the Philosophers*), to refute on twenty counts the errors of the Muslim 'philosophers' and their theistic Greek predecessors. From al-Ghazali's Islamic viewpoint, they must be reckoned rejectors of Islam (*kāfir*) on three counts, and of holding heretical views on seventeen counts.[13]

We must note here that al-Ghazali's entire attack is against specific metaphysical and cosmological doctrines postulated by erroneous 'philosophers' (*falāsifa*). He is not against rationalism or the 'philosophical' sciences as such. He rejected the fraudulent ideas, and the pseudo-'philosophical' and pseudo-*shar'iyya* sciences, on Islamic ideological and humanist grounds; he denied their claim to being genuine knowledge.

Within a hundred years after al-Ghazali's refutation of the 'philosophers', Abu al-Walid Muhammad ibn Rushd (Averroes, d. AH 595/AD 1198) defended them in his rejoinder, *The Incoherence of the Incoherence.* Ibn Rushd, one of the most influential men in the history of Western civilisation, is best known in the Muslim world as a physician, and an authority on Islamic jurisprudence.[14] He maintained that al-Ghazali was not justified in charging the Muslim 'philosophers' of either unbelief or heresy in Islam on the basis of *ijmā'* since no technically valid consensus exists among Muslims on matters of Islamic doctrine. Islam is based on the three basic beliefs, the existence of God, prophecy, and resurrection. Mankind comprises three classes: the 'philosophers'; the theologians; and the common people; who follow respectively, the demonstrative, dialectical, and rhetorical methods of knowing God. All these methods are recommended and used in the Quran. The 'philosophers' follow the method of rational demonstration (*burhān*). As long as the Muslim 'philosopher' believes in the three basic beliefs mentioned above, insisted Ibn Rushd, he is free to believe in what he likes by following his demonstrative way to God, or the method of the 'philosophical' sciences. There is a complete accord between the rational and demonstrative conclusions of 'philosophy', and the *shari'a*, that is, the conclusions of the 'philosophical' and *shar'iyya* sciences. Ibn Rushd said: 'We Muslims know categorically that demonstrative reasoning does not lead to disagreement with what the divine law [*shari'a*] has brought forth. For truth does not contradict truth, but agrees with it, and is a witness to it.'[15] When the traditional (*al-manqūl*) is in conflict with the rational (*al-ma'qūl*), the traditional must be brought into harmony with the rational, that is, with the results reached by the demonstrative or 'philosophical' sciences. The responsibility for giving the traditional a conformable interpretation (*tā'wīl*) rests on the 'philosophers' who possess the specialised knowledge.

Despite this attack on 'philosophers' by al-Ghazali, and their defence by Ibn Rushd, we learn from a leading authority on Muslim philosophy

that the resemblances in the views of al-Ghazali and Ibn Rushd sometimes appear to be greater than their differences.[16]

Praiseworthy 'philosophical' sciences. Al-Ghazali's third category in the ideas and sciences engaged in by the 'philosophers' comprised 'what is not to be denied at all'. He had refuted the two other categories which he thought amounted to unbelief and heresy in Islam.

Al-Ghazali had pointed out that the erroneous 'philosophers' mix their own false notions with truth in their writings on mathematics, political economy or ethics. From this arise two wrong tendencies in men of weaker intellect, one in the partisans and the other in the opponents of these 'philosophers'.

The partisan admires the precision and clarity of the 'philosophers' in their exposition of mathematics, for example. Due to this good opinion resulting from what he approved, he accepts their authority with regard to all sciences, thus becoming subject to *taqlīd maḥḍ*. Similarly, the fanatic and ignorant opponents reject blindly and *a priori* all that is found in the books of the 'philosophers'. They resemble the man who shrinks from receiving pure gold taken out of the bag of the counterfeiter. The educated man's attitude toward the ideas and sciences of the erroneous 'philosophers' must be:

> If they are reasonable in themselves and supported by proof, and if they do not contradict the Book [Quran] and the *Sunnah* (the example of Muhammad), then it is not necessary to abstain from using them. If we open this door, if we adopt the attitude of abstaining from every truth that the mind of a heretic has apprehended before us, we should be obliged to abstain from much that is true.
>
> Yet this is the prevalent idea among the majority of men. . . . They always make the man the criterion of truth and not truth the criterion of the man; and that is erroneous in the extreme.[17]

Educational and research policies and planning[18]

Al-Ghazali applied the same ethico-sociological criteria in formulating the principles and policies of human resources development.

The individually obligatory knowledge should be acquired first before gradually embarking upon specialisation, that is, the *farḍ kifāya* sciences obligatory from the community's viewpoint. Among the praiseworthy specialised sciences, those for which there is a social demand must be acquired in preference to the trivial and obscure or too highly specialised sciences. Social utility, requirements, and *kifāya* in a dynamic time-space context rather than individual interest and private benefits should be the criteria for manpower development. Al-Ghazali deplored the fact that abandonment in his times of these principles and priorities led to a situation wherein no Muslim physicians could be found in many towns while there was an oversupply of lawyers and jurists who specialised in obscure and socially unnecessary details of Islamic law. Such an

imbalanced concentration on Islamic law beyond the point of social sufficiency was due to the lack of social control and direction of individual preferences. More basically it was because the educational system was neglecting the development of the 'sciences of the states of the heart' or Islamic ethics. Higher education became a tool to maximise personal wealth, power, and pleasures at the expense of social utility. Thus studies in Islamic law were pursued to obtain access to management of wills and private properties, and appointment to judicial and administrative government positions.

How much knowledge of particular sciences must an individual acquire? Partial as well as total knowledge of blameworthy sciences must be shunned since their harm exceeds their utility. When they are of 'no use whatever, to spend in them in one's life, the most precious thing a man possesses, is sheer waste.' Partial as well as total knowledge of the individually obligatory sciences, particularly 'the science of the states of the heart' (ethics) is praiseworthy; 'in fact the more one acquires of it the better.' Knowledge of the *shar'iyya* and non-*shar'iyya* socially obligatory sciences is praiseworthy within certain limits. Their knowledge becomes blameworthy when it violates the criteria of social utility and sufficiency. Knowledge of these praiseworthy sciences must be pursued in three stages of increasing expertness: limitation (*iqtiṣār*); moderation (*iqtiṣād*); and finally the stage of thoroughness (*istiqṣā'*), 'which goes on and on during the entire life of the seeker' of knowledge.

Discussion

Al-Ghazali classified knowledge and education on three distinct bases. First, he applied to educational philosophy the basic distinctions of Islamic law with regard to man's individual obligations, and his duties to meet the demands and needs of a developing environment. The individually obligatory education is basically ethico-legal or Islamic civics. The aim of specialised education or vocation is to develop some skill, trade, or knowledge in order that the individual may earn his living while enhancing the common good. Corruption of all types is widespread in contemporary developing countries.[19] Engineers exercise tremendous authority through management of environmental resources; public and private projects; capital resources for the development of industry and agriculture; and education and research in engineering and technology.... Therefore, development of the moral personality of engineers through concentration on the *farḍ 'ayn* sciences such as recommended by al-Ghazali is particularly important from pragmatic considerations for socio-economic development with equitable income distribution.

Second, al-Ghazali distinguished between the *shar'iyya* and non-*shar'iyya* sciences. Discussion on some aspects of this classification is deferred until their elaboration below after Ibn Khaldun. Al-Ghazali,

like other Islamic scholars before and after him, recognised explicitly only Arabic linguistics and the history and biography of Muslims of the early post-Quranic generations as sciences 'instrumental' in understanding the *sharī'a*. Not by design, but by implication this would restrict the source and method of understanding the will of God, Islam, or *sharī'a* to only scriptural revelation and deductive reason. This implies neglect of the inductive method, and the objective conclusions of the natural and social (or 'philosophical'), sciences as 'signs of God' and the second source of knowledge. But this is the basic postulate of the 'two-book' school of Islamic epistemology. It asserts that the way to God, truth, and science is through both the Quran and the cosmological sciences.[20] Neglect of this second method and source of knowledge would be contrary to the fundamentals of Quranic epistemology (Chapter 1), and the meaning of *qiyās* or *ijtihād* as both inductive and deductive reason (Chapter 2). Ibn Rushd had rightly asserted that rational demonstration as a method, and the 'philosophical' sciences as sources are as valid and authoritative as the theologian's sources and his dialectical method of knowing God's will. Any downgrading of inductive reason and the 'philosophical' sciences, and consequently the method of rational demonstration or the scientific method, would lead to the dead end of 'scholasticism', and stifle the growth of science and other socio-cultural subsystems. Such neglect of the inductive method, and consequently the rise of scholasticism, did indeed take place and was one of the major causes of decline in the Muslim world of science and learning from the late medieval centuries.[21]

Third, al-Ghazali made a distinction between the praiseworthy and blameworthy sciences based on:

(i) the compatibility of the sciences or their specific doctrines with Islamic ideology;

(ii) the intrinsic worth of the sciences in terms of public interest, and the social and functional utility of the specific discipline or vocation in terms of its uses and benefits to a society in the given space-time context.

As to the former criterion, if a culture and state must be ideologically Islamic, it is inescapable that some values and principles of the scientific-technological and humanistic-social sciences will have to be recognised as categorically Islamic or un-Islamic, and others as orthodox and un-orthodox or majority and minority but all valid Islamic viewpoints. It is in this sense that the systematic critique by al-Ghazali of the 'philosophical' sciences and their specific doctrines of his day assumes an enduring significance. This does not speak for or against the specific ideas of al-Ghazali since the ephemeral nature of civilisation and the relativity of human thought are bound to change human judgements. Thus economics and political science of al-Ghazali's time, being rooted in Islamic ethics and ideology, were basically praiseworthy sciences. This is not true today.

Like all other humanistic-social sciences and scientific-technological

knowledge inspired and pervaded by Western-secular and Marxist-atheist ideologies, modern economics and political science need to be restated in terms of the all-inclusive integrated culture of Islam. The method of arriving at these doctrinal conclusions, as both al-Ghazali and Ibn Rushd would agree, is by subjecting individual expert opinions to the test of Muslim *ijmā'*, in a proper institutional framework. In the realm of law there is unanimity among all classical, and modern, Islamic schools of law on fundamental principles and doctrines. They also formally recognise the zone of acceptance of dissent (*ikhtilāf*), on details in the form of the five major, and other minor, classical legal schools, all of which were accepted as equally Islamic and orthodox. Similarly, the value-orientations, institution-orientations, and action-orientations of various rational ('philosophical'), and *shar'iyya* sciences would be considered praiseworthy or blameworthy, from Islamic ideological and sociological viewpoints, at different levels of meaning and significance. As to the sociological criteria of al-Ghazali, our study of Islamic law has brought out the humanistic and anthropocentric ethos of Islam. Education and research must serve praiseworthy individual and public interests, but should not become an instrument of unethical utilitarianism. They cannot be justified as an end in themselves, pursued as intellectual luxury and snobbery, and to satisfy personal greed and national pride.

These insights and conclusions must be applied to education, research and development policies; and professional practice of environmental engineering systems planning. We have applied this Islamic ethos in epistemology and education in this chapter in presenting an Islamic classification of disciplines comprising environmental engineering systems planning, to integrate engineering education and research policies and planning with Islamic social ethic, and in presenting an outline of the humanistic-social sciences stem of engineering education from Islamic perspective. The vindication of Ibn Rushd's central theme of basic harmony between the *shar'iyya* and the 'philosophical' sciences, and the complementary relations between them, will be fully brought out in Chapter 4 where traditional Islamic law is harmonised with contemporary environmental facts and scientific-technological knowledge pertaining to water law.

Islamic philosophy of knowledge according to Ibn Khaldun (AH 732–808/AD 1332–1406)

Abd al-Rahman ibn Khaldun was born in Tunis. During his first forty-odd years he lived in Muslim Spain and North Africa amidst political throes, and served many a ruler in high government positions. After AH 784/AD 1382 until his death, he served in Egypt as a college professor and president, and a chief judge. Ibn Khaldun is known as a historian, and a sociologist of politics, economics, urban life, and knowledge.[22] His fame,

as the father of philosophy of history and sociology in a modern sense,[23] rests on the voluminous *Prolegomena* (*Muqaddimah*) to his *Universal History* written during a temporary retirement in an Algerian fort. Toynbee refers to the *Prolegomena* as the product of 'a single "acquiescence" of less than four years' length' (AH 776–779/AD 1375–1377), in which Ibn Khaldun 'conceived and formulated a philosophy of history which is undoubtedly the greatest work of its kind that has ever yet been created by any mind in any time or place.'[24] We shall use Ibn Khaldun's essentially Islamic epistemological, political, and economic ideas in this study.

Classification of knowledge

Like al-Ghazali, whose views he shares, Ibn Khaldun continued the Muslim traditional classification of sciences and added his own contributions. The most important distinction he made in describing the sciences existing in the medieval Muslim civilisation is between the *shar'iyya* and the 'philosophical' sciences.

Shari'a-*based* (shar'iyya), *or transmitted* (naqliyya), *or positive* (waḍ'iyya) *sciences.* During the early post-Quranic period, the *shar'iyya* sciences, dealing primarily with Islamic law and religion, comprised the Quranic sciences, the *Sunnah*, principles of *sharī'a*, and *fiqh*. To these were added later on, as an unlawful innovation (*bid'a*), speculative theology, Sufism, etc.[25] The clear and direct vision of the Prophet-legislator enables him to break through 'the veil' or limits imposed on theoretical human reason. This is the source of 'the legal material of the Quran and the *Sunnah*' (*sharī'a*). 'All these transmitted sciences belong exclusively to the Islamic community and its people, although in general there have to exist in every community similar sciences which are homonymous with these in the distant genus (*jins ba'īd*), insofar as they are [all] legal sciences.'[26] Thus every nation or community in the world has its own law (*sharī'a*), and the positive sciences based upon it which supply its believers their dogmas and doctrines, and prescribe the obligatory, forbidden, permissible, praiseworthy, and blameworthy acts; there is the law of the Jews (*sharī'at al- Yahūd*), and the law of the Christians (*sharī'at 'Īsā*).[27] However, the *shar'iyya* sciences of all other religious communities are only 'remotely comparable' to those of Islam. The other religions, unlike Islam, do not have a universal mission, are not all-inclusive, but are concerned with a narrowly conceived 'religion' which excludes acquiring political power and leadership for social organisation.[28]

The role of reason in the *shar'iyya* sciences is defined and limited by the pragmatic end of relating problems of detail with the basic principles of *sharī'a*. Unlike the common believers, the knowledge of the Prophet is not limited by theoretical reason to sensible things alone. The believers, therefore, are forbidden from wasting their efforts in exploring the rational truth behind the unseen (*al-ghayb*) dogmas of religion. They

should not make theology or metaphysics the object of a theoretical science. 'Such speculation is a field in which the mind becomes lost and gets nowhere, nor gains any real insight.'[29]

*The 'philosophical' (*falsafiyya*), or rational/intellectual (*aqliyya*), or 'natural' (*ṭabī'iyya*) sciences.* There are four basic 'philosophical' sciences, each of which has many subdivisions. They are: logic, natural sciences or 'physics' (for example, medicine, agriculture); metaphysics; and the mathematical sciences (for example, geometry, arithmetic, music and astronomy). The 'philosophical' sciences are also called 'natural' sciences because all men are capable of knowing them by the very 'nature' of man as a rational being.

> The intellectual sciences are natural to man inasmuch as he is a thinking being. They are not restricted to any particular religious group. They are studied by the people of all religious groups who are all equally qualified to learn them and to do research in them. They have existed (and been known) to the human species since civilisation had its beginning in the world. They are [also] called the sciences of philosophy and wisdom.[30]
>
> The 'philosophical' sciences are 'those that man can know by the nature of his thought, and through his human perception can arrive at their subject matter, problems, ways of demonstration, and the manner of teaching them – until his reflection and investigation lead him to [distinguish] truth from falsehood in them.'[31]

The *shar'iyya* sciences, including languages and their dialects and scripts (the instrumental sciences), may vary with nations and communities. But the rational sciences are a truly international aspect of human culture.

> The philosophical sciences do not show differences. They have developed uniformly, as required by the very nature of thinking, which is concerned with the perception of existing things as they are, whether corporeal, spiritual, celestial, elemental, abstract, or material. These sciences show no differences. Differences occur in the various religious [*shar'iyya*] sciences because of differences among the various religions.[32]

'Philosophical' knowledge is essentially a search for the sensible things through man's ability to think. The search proceeds from initial ignorance to probable knowledge, and from effects to causes which are themselves unknowable.[33] The remoter the causes, the more arduous and longer the search. The knowledge acquired is neither complete nor its solutions final. Particularly in the case of problems investigated by metaphysics, one has to be satisfied with 'only what is most suitable and proper – that is, conjecture'[34] instead of certainty. 'The ultimate end [of man's capacity for rational knowledge] is the conception of existence as it is in its general and specific differences, and its distant and proximate causes.'[35]

The shar'iyya *and 'philosophical' sciences: disentangling their confused inter-relations*

Ibn Khaldun's critique of sciences falls in the familiar pattern of the critique by Islamic philosophers of the epistemologically false doctrines, and the sociologically and pragmatically blameworthy sciences.[36] Like al-Ghazali, Ibn Khaldun presented a selective refutation of some of the sciences. He exposed the theoretical illegitimacy of those disciplines which were creating confusion by occupying an ambivalent position between the *shar'iyya* and the 'philosophical' sciences. These sciences were dialectical metaphysics, Sufism, and speculative theology. He summarily rejected the pseudo-rational sciences – sorcery and talismans, numerology or the science of the secrets of alphabetical letters, alchemy, and astrology.[37]

The primary theoretical aim of Ibn Khaldun was to define and delimit the overall unity of basic principles; distinct primary sources and methods of knowing; unique function in the life of individuals and society; and the proper domain, subject matter and goals of the *shar'iyya* and 'philosophical' sciences. Ibn Khaldun 'defends religion [Islam] against the mistakes of theologians and philosophy against the mistakes of philosophers'. He 'upholds the legitimacy of both religious knowledge and scientific philosophic knowledge in their proper spheres.'[38]

The 'philosophy' which Ibn Khaldun attacks is neoplatonism. The 'philosophers' responsible for this confusion were, allegedly, al-Farabi and Ibn Sina, who had themselves criticised the 'philosophers'; and Aristotle identified mistakenly with an apocryphal work. The neoplatonists confused the two classes of sciences by resorting to rhetorical and dialectical methods in the pursuit of 'philosophical' sciences instead of following the 'way of demonstration'. Ibn Khaldun clarified the distinct methods of acquiring the two kinds of knowledge:

1 'Philosophical' or rational knowledge is gained by the demonstrative method by perfecting man's rational faculty. Its realm is limited to the *existentia*, what is 'observable' and encompassed by perception and apperception through use of the three levels of intellect – discerning, experimental, and theoretical intellects.
2 The prophetic method bypasses the rational processes and gains a clear and direct vision of the *sharī'a*. It's proper realm is knowledge of the things 'beyond sensual perception', the *spiritualia*: the domains of theology and metaphysics, and value-judgements to distinguish between vice and virtue.[39]

The neoplatonist 'philosophers' on the other hand 'think that the essences and conditions of the whole of existence, both the part perceivable by the senses (*sensibilia*), and that beyond sensual perception (*spiritualia*), as well as the reasons and causes of (those essences and conditions), can be perceived by mental speculation and intellectual reasoning'. However, even Plato had admitted that 'the limit that human thinking can reach' regarding the knowability of the *spiritualia*, is 'only

what is most suitable and proper – that is conjectures', rather than certainty. Similarly, dialectical theologians and gnostic Sufis (mystics), attempt to give logical and rational proofs for religious dogmas whereas they are also 'beyond sensual perception' and a part of the *spiritualia*. These two groups seek to perceive 'the whole of existence' with their dialectical tools, but 'existence is too vast to be completely encompassed or perceived, either spiritually or corporeally.'[40]

The *sharī'a* prohibited speculation about the causes and essences of the *spiritualia* because God and His Prophet know what is within man's capacity to know, what is in his best interests, and contributes to his happiness. 'Such speculation is a field in which the mind becomes lost and gets nowhere, nor gains any real insight.'[41] (See Chapter 1.)

The 'philosophers' claim that 'happiness consists in arriving at perception of all existing things', the *sensibilia* and the *spiritualia*, 'with the help of rational speculation and argumentation'. They equate happiness with knowledge, and eternal torment with ignorance. The way to happiness through the *sharī'a* is by performing the religious and ethico-legal social duties of *shar'iyya* sciences; and by seeking a living employing the 'philosophical' sciences, arts, crafts, and vocations.[42]

While some 'philosophers' postulate the self-sufficiency of natural reason, claiming that without scriptural revelation man would still be 'able to distinguish between vice and virtue in (his) actions by means of his intellect, his (ability to) speculate, and his natural inclination toward praiseworthy actions, his natural disinclination for blameworthy actions',[43] Ibn Khaldun pointed out that rational knowledge or 'philosophy' can only arrive at tentative facts that are 'observable' and 'attested by sensual perception', such as those of the 'corporeal *existentia*' comprising the realm of the natural sciences or 'physics'. 'Philosophy' cannot establish value, the criteria to distinguish between 'vice and virtue', 'praiseworthy' and 'blameworthy' actions, which lies in the domain of the *sharī'a*. Morality and ethics have no natural basis; they cannot be established by natural reason or 'philosophy' as universal rules of conduct in the same way that it can develop universally valid 'philosophical' or natural sciences. The *sharī'a* provides that ground or necessity for morality and ethics. It provides the justification, obligation, and authority to compel citizens to do 'what is good and desist from what is evil'.[44] Therefore, Ibn Khaldun restricts the 'philosopher' to the practice of the demonstrative sciences – logic, natural sciences, mathematics; and the useful disciplines – music, medicine and law; and the 'philosopher' should obey, uphold, and enjoin the normative *sharī'a*.[45]

On the basis of these premises and criteria Ibn Khaldun launched his refutation of false sciences from the Islamic sociological viewpoint. He claimed that alchemy and astrology, for example, would become perfectly legitimate sciences if their subject matter, methods, and goals were properly delimited so as to remove their ambivalent stand between the

shar'iyya and 'philosophical' sciences. Astrology would become astronomy, 'a noble craft' dealing with the movement of stars. Alchemy would become chemistry, 'a natural craft' dealing with 'the nature of matter'. But the astrologers and alchemists were mere pretenders to both the prophetic method of direct vision 'beyond sensual perception', and the demonstrative method of the 'philosophical' sciences in the realm of the *existentia.* They confused the two methods, and corrupted the goals and social functions of the sciences. The alchemists indulged in unintelligible and puzzling expressions incapable of producing their intended results. Economic ruin was brought on the practitioners and patrons of alchemy who wished 'to get rich all at once'. Its students became incapable of following a natural, legitimate profession like agriculture or commerce; instead, they lived a life of fraud and deception. They made 'a business out of thievery' by counterfeiting, a threat to the national economy.[46]

Ibn Khaldun had a predecessor whose ideas and method he had mastered. That was Ibn Rushd who had written 'the most celebrated treatise on religion and philosophy the main theme of which is the defence of the legitimacy of religion and philosophy in their proper spheres."[47]

Discussion

Ibn Khaldun and al-Ghazali tried to keep the proper distinctions and hierarchical relations between the *shar'iyya* and 'philosophical' sciences, values and facts. This is essential to save science from magic and miracles, and the *sharī'a* and ideal Islam from credulity, superstition, and pseudo-religious obscurantism. The confusion between the two classes of knowledge is one of the most basic and important reasons for the post-medieval decline of Islamic idealistic rationalism and Islamic civilisation, and the rise of irrationality through the use of spiritual intuition for decision-making in innumerable situations where rational methods and knowledge of Islamic economics, political science, sociology, science and technology are required. Rational methods and techniques of engineering, socio-economic and politico-legal decision making are at the heart of environmental engineering systems planning.

Decisions must not be based on *zann*, made 'by going into a trance and coming out with the answer'. They must be supported by *burhān.*[48] The dissemination of these principles of Islamic epistemology are a prerequisite for the survival of both *sharī'a* values and rationality in environmental engineering systems planning.

An Islamic classification of disciplines comprising environmental engineering systems planning

The publications of the American Society for Engineering Education

often bifurcate disciplines pertinent to engineering education into scientific-technological and humanistic-social sciences stems. The former might also be called the technical sciences stem.

The disciplines comprising environmental engineering systems planning are: the specific environmental resource, such as water resources; the pertinent engineering and technology; economics, including engineering economy and development planning; the other social and humanistic sciences like political science, including public administration and international relations; law, internal and international; languages, history, sociology, philosophy, psychology, ethics and aesthetics. Social and humanistic sciences could be related directly to some branch of engineering and deal with such subjects as the history of science and technology; sociology and philosophy of science; industrial psychology, etc. Some of these humanistic-social sciences, or their specialised branches, become more important than others depending on whether we are interested in the humanistic and social sciences for their instrumental value contributing directly to the professional performance of engineers, or for their intrinsic value in terms of a philosophy of engineering education aimed at developing an 'integrated engineer' patterned after an ideological model personality.

In the light of our review of Islamic philosophy of knowledge and education, it is imperative that we distinguish between the value-impregnated and the value-free; the ethically charged and the morally neutral; the universal, rational and ideological realms of the disciplines comprising environmental engineering systems planning. The Islamic approach must establish the relation and hierarchy between the *sharī'a* – or ideology – susceptive and universal rational sciences.

Each of the sciences comprising environmental engineering systems planning has two distinct facets.

Sharī'a-*susceptive realm of environmental engineering systems planning*

The *sharī'a*-susceptive, or ideology-susceptive, realm of the disciplines comprising environmental engineering planning is homogenous, *mutatis mutandis*, to the *shar'iyya*, the transmitted or positive sciences discussed by Ibn Khaldun and al-Ghazali.

In the traditional Islamic classification of knowledge, the *shar'iyya* sciences were so called because their primary source was scriptural revelation. However, Islamic epistemologists and educationists, including al-Ghazali and Ibn Khaldun, assiduously brought all non-*shar'iyya* or the rationally derived humanistic-social and natural sciences within the purview of the Islamic world-view and ideology defined by the *sharī'a's* legal, philosophical, and sociological norms, values, goals, and functions. Once a distinction had been made between the *shar'iyya* and rational or 'philosophical' sciences on the bases of their unique primary sources, subject matter, and methods of knowing them; there was no doubt that

sapientia (divine wisdom) or *sharī'a* determined and dominated the purpose, goals, social role and ideological milieu of *scientia* (human, rational knowledge). Historically, traditional Muslim education, including higher technical and scientific education, not only made provisions to teach the *shar'iyya* sciences; all the pure and applied natural and humanistic-social sciences were taught to Muslim students from the perspectives of the Islamic world-view. This is apparent from the curricula of the medieval Islamic schools and universities.[49] We shall describe below the *sharī'a*-susceptive facets of some of the technical and humanistic-social sciences germane to engineering education, particularly environmental engineering systems planning.

Universal rational realm of environmental engineering systems planning
This facet of the disciplines comprising environmental engineering systems planning is homogenous, *mutatis mutandis*, to Ibn Khaldun's description of the *'aqliyya* sciences, or the 'natural' or 'philosophical' sciences; and to al-Ghazali's non-*shar'iyya* ('philosophical') sciences. Knowledge in this realm, by definition, must be affected explicitly by value and specific cultural constraints. This realm can be more closely identified with the scientific-technological stem of engineering education. The knowledge, human interests and activities in this realm pertaining to the objective, observable and demonstrable facts and their interrelations, are *mursal* to the explicit texts of the *sharī'a*. As al-Ghazali pointed out, the primary source of this kind of knowledge is reason, experimentation, and acculturation. This domain of the sciences deals with the *existentia* and the *sensibilia*; not value judgements and the transcendental truths of *spiritualia*. As Ibn Khaldun further pointed out, the universal rational domain encompasses all demonstrative sciences which are 'studied by the people of all religious groups who are all equally qualified to learn them and to do research in them' by virtue of the fact that man by nature is a rational being. This is truly an international domain of human culture.

There is no Islamic or un-Islamic mathematics, structural engineering, soil mechanics or exclusive national hydrology. The universal rational realm of the disciplines comprising environmental engineering systems planning includes their technical and technological theory, art, and practice; methods and procedures for data collection, quantitative analyses, and administration pertaining to all technical and humanistic-social sciences. Such is the case, for example, with regard to the methods and techniques of quantitative analysis, design, planning, development, conservation, and administration of natural resources.

Functionally, the study, research, and applications of the universal-rational realm of these disciplines are instrumental to the terminal goals approved by the *sharī'a* on the bases of its ideological and sociologically praiseworthy criteria.

Developing Islamic environmental engineering systems planning through imitative-innovative assimilation

We concluded in Chapter 2 that the Islamic ethos, crystallised methodologically as principles of *sharī'a*, presents a triadic method for the continuous growth of Islamic civilisation. (i) Islamic law ordains invention and innovation through 'systematic original thinking' or 'independent reasoning'. It lays down the principles and conditions for continued assimilation into Islamic civilisation of the past and present contributions by Muslims and non-Muslims through their (ii) reform, review, and adaptation, and (iii) selective imitation with little or no change, using the various mechanisms of cultural diffusion or borrowing. The possibility for innovation and social imitation arises only with respect to that about which the *sharī'a* is at the outset neutral. It should belong to the domain of what is *mubāḥ*, but is neither *fard* nor *ḥarām* according to the explicit *sharī'a* texts.[50]

The possibilities for innovation and imitation present both opportunities and pitfalls. These are familiar to students of sociology, particularly socio-technological changes through diffusion.[51] It is sufficient to warn against the tendencies towards blind imitation of technologies, ideas and cultural traits developed in an alien social and technological environment.[52] Furthermore, in recent years the environmental movement, institutionalised on a global scale under the United Nations Environment Programme, has brought out the need and urgency for a re-appraisal of socio-economic developmental goals and strategies; and for a search for ecologically appropriate sciences and technologies for the less-developed as well as the wrongly-developed industrialised nations. Thus innovation itself has come to mean the re-discovery of the contemporaneity of traditional technologies and their wise adaptation.

We must here emphasise the organic relation between social imitation or diffusion, and innovation. They are both adaptive-creative processes requiring originality. There can be no inventions and innovations without imitation[53] which is essentially a process of learning, catching up with the best known knowledge, and imbibing the proper cultural traits. The history of the growth and ascendancy in the world of the medieval Islamic science and civilisation, and the modern ascendancy of the West prove this point. The medieval Islamic civilisation emerged through assimilation of Greco-Hellenistic, Syriac-Alexandrian, Zoroastrian, and Hindu scholarship. It encouraged and employed the talents of the non-Muslims and absorbed converts to Islam from many diverse cultures and nations. Similarly, the West emerged from her Dark Ages by assimilation of Islamic civilisation by means of translations mainly from Arabic.[54] The West employed various other mechanisms of diffusion including direct contacts and conflicts with Islamic thought and socio-cultural institutions in Muslim Spain, Southern Italy (especially Sicily), Southern France, and later on during the Crusades in the Middle East (Palestine, Jordan,

Lebanon and Syria). The rejuvenation of medieval Islamic culture, and the Western Renaissance and Reformations are discussed in detail in Chapter 7 in order to suggest basic patterns of imitative-innovative processes for contemporary rejuvenation of science and civilisation in the Muslim world.

Imitative-innovative assimilation in the sharī'a-*susceptive realm of environmental engineering systems planning*

Modern technical and humanistic-social sciences were developed mostly by non-Muslims during the last two or three centuries which are both the 'Dark Age of the Muslims' and the age of their modern re-awakening.[55] Modern Western civilisation is founded on the premises of secularism and mechanistic naturalism. Even if some or many of its leading men of science and learning believe in a religion in their private lives, Western technical and humanistic-social sciences are permeated with secularist, agnostic, and even atheistic philosphical and cosmological doctrines. The Communist system of education, on the other hand, is based on the blatant atheism of dialectical materialism. For these reasons assimilation through direct borrowing and secondary diffusion from these contemporary developed civilisations in the *sharī'a*-susceptive realm should be consciously and severely limited. Nevertheless, Muslims could learn a lot from study of the content, structure, and organisation of the ideology-oriented subjects taught in engineering curricula in modern Western and Communist countries. This is the mechanism of 'diffusion by stimulus' which we have adopted below in describing, after comparison with the content of medieval Islamic higher education, the outlines of Islamically oriented courses in humanistic-social sciences stem of engineering education.

The deliberations of Islamic scholars of the last fourteen centuries would be relevant for the contemporary reformulation of the *sharī'a*-susceptive realm of environmental engineering systems planning. We would find direct borrowing from Islamic tradition an extremely important mechanism in the imitative-innovative processes in matters pertaining to the domain of the *sharī'a*. The perception of the permanent values and ideal cultural patterns of Islam will not change appreciably since the Quran and *Sunnah* are their immutable sources. However, in *fiqh*-susceptive realm of environmental engineering systems planning, the contributions of the Islamic scholars of previous centuries are much less susceptible to direct borrowing since this realm is subject to changes in technological and sociological factors. Similarly, critiques of materialists, naturalists, and theists among the 'philosophers' by al-Ghazali, Ibn Khaldun, and other philosophers of Islam would be useful in the refutation of similar contemporary non-Islamic world-views. More importantly the history of Islamic ideas and institutions is invaluable for the detailed formulation of the ideological content of engineering education for the

renascent Islamic countries. The ephemeral nature of the *fiqh*-susceptive realm of water law, for example, will be brought out in Chapter 4. This is an area where innovation or *ijtihād* is indispensable.

Imitative-innovative assimilation in the universal rational realm of environmental engineering systems planning

The researches of non-Muslim scholars in the universal rational realm of disciplines comprising environmental engineering systems planning, in particular the scientific-technological stem of engineering education; are ideologically 'neutral' in a relative sense. They are for assimilation by Muslims by employing the mechanisms of diffusion. Indeed, up-to-date findings by non-Muslims in this realm of knowledge must be preferred by Muslims to the contributions of the greatest medieval scientists – even Muslims like al-Biruni in geodesy, or Ibn al-Haitham in physics, or al-Khwarizmi in mathematics.[56] This is an explicit implication of the fundamental *sharī'a* principle, *istiḥsān*. Direct borrowing from foreign sources is also explicitly enjoined by various fundamental principles of the *sharī'a* (Chapter 2). Their implications for environmental engineering systems planning will be further discussed in Chapter 4. We must recall here the Islamic criteria for Muslim adaptation of the 'praiseworthy "philosophical" sciences' authored by the erroneous 'philosophers' discussed by al-Ghazali.

The ideologically 'neutral' borrowings may not be without psychological discomfort, and serious political and cultural repercussions in human and international relations. This may be explained by the theory of cognitive dissonance.[57] The history of Muslim-Western interpenetrations in science and civilisation provides both parallels and contrasts. In the absence of the Islamic epistemology, Islamic international law and international relations, and Islamic principles of science and cultural policies, the medieval Christians showed extreme psychological, cultural and political reactions.[58] Indeed, the Western Judeo-Christian history of contact with the ascendant or descendant Muslim science and civilisation during the last fourteen centuries, has oscillated from one extreme of xenophobia to the other of imperialism (Chapter 7). But the Quran, the *Sunnah*, and the fundamental principles of the *sharī'a* not only legalised but made such borrowings obligatory for Muslims (Chapters 1 and 2). Thus the medieval Muslims were able to appropriate the best in mankind's heritage as their own in the spirit of the oneness of man, God, and the revelations of His will; without any psychological discomfort or racial and cultural bigotry. They fully acknowledged the sources of their borrowings with far-reaching consequences for inter-cultural and international relations. In contrast, the centuries of decline of Muslim civilisation, particularly the AH twelfth and thirteenth/AD eighteenth and nineteenth, are characterised by the abandoning of the *sharī'a* principles of alien borrowings, and the dominance of Muslim zealotry which con-

demned permissible borrowings as heretic innovation (*bid'a*).[59] Thus the contemporary imitative-innovative assimilation by Muslims of the universal rational sciences and technology requires a full self-consciousness by Muslims of the scope and limits of *sharī'a* principles of permissible and forbidden, praiseworthy and undesirable alien borrowings.

In the assimilation of the universal rational realm of scientific-technological and humanistic-social sciences, transmission of knowledge through translations into the languages of the borrowing Muslim nations must be given the greatest importance and the first priority today. The history of the rise and growth of medieval Islamic and modern Western civilisations brings out the importance of translations most emphatically. The main age of translation of classical works into Arabic from Greek, Syriac, Pahlavi, and Sanskrit lasted for about 150 years from the middle of AH second/AD eighth to the end of the AH third/AD ninth centuries. This laid the foundation for the creative period of medieval Islamic science and learning in the following centuries.[60] We must also emphasise the role of 'primary diffusion'; that is, travelling in search of knowledge[61] – education, training, and research in the Muslim world as well as in the technologically advanced countries; participation in international conferences; and, most important, migration to the underdeveloped countries to transfer the assimilated modern sciences and technologies. This calls for not only prevention and reversal of brain drain from underdeveloped countries; there should also be planned immigration to the less developed countries from among the most developed countries.[62]

The history of science and civilisation shows that civilisations emerged and nations developed only when individuals and governments created viable institutions to promote and retain indigenous scholarship, and followed deliberate 'brain gain' policies by including immigration of highly skilled manpower.[63] The Muslims followed Islamic social policies for the development of science and learning during the centuries of their medieval growth and supremacy at both the voluntary and governmental levels. The renaissance of the medieval West was a consequence of brain gain policies. The contemporary trend in the immigration of highly qualified persons to the USA and the other Western countries is due to deliberate political and legal decisions and institutional arrangements; a pervasive social environment, and science and technology policies. These are designed in the West to attract and retain foreign nationals but, in the less developed societies and states, to repel and reject even their own skilled and creative talents.[63]

Furthermore, what is to be assimilated from the universal rational realm must be first subjected to rigorous sociological and technical, rather than ideological, constraints for compatibility with the public interest of the borrowing countries. This calls for innovative and dynamic adaptation in the choice of alternate technologies and production techniques to conform with the socio-economic and technical needs of these

countries.[64] As al-Ghazali so rightly pointed out, knowledge and human activities in this realm are needed and justified only in terms of social utility, need, and sufficiency. Private interests and individual preferences must be subordinated to national needs, objectives, and interests in the acquisition and utilisation of specialised knowledge. Disregard of this principle in what is transferred to and assimilated by backward countries leads to costly errors in the policies and priorities for education and research, and in manpower planning. We are faced with ironic situations of over-specialisation by engineering students of backward nations in esoteric subjects based on the needs and priorities of advanced countries; and neglect in developing intermediate-level engineering and technical manpower required to meet the real social needs of the developing countries.[65]

Like the non-*shar'iyya* sciences of al-Ghazali, the universal rational realm of environmental engineering systems planning is not absolutely value free. The pursuit of this realm is an instrumental goal; its terminal goals are determined by the *sharī'a*.

Islamic engineering education: the teaching of humanistic-social sciences in technical education to Muslim and non-Muslim students in the Islamic setting

Most of the present-day independent Muslim countries have declared Islam their state 'religion' in their constitutions, or otherwise made it so *de facto*, like Saudi Arabia. This must be looked upon as a mere beginning of an ideological commitment to implement the *sharī'a* in all its comprehensiveness according to the distinction made by Ibn Khaldun when he contrasted the Islamic *sharī'a* with other religions. But this has not been taken up seriously through allocation of material and human resources commensurate with the requirements of such a massive intellectual undertaking by any Muslim state, a single university, or any of their Islamic research institutions. Despite the great strides made in recent years in the quantitative expansion of engineering education, there is not even a recognition of this problem and challenge in the studies published through inter-governmental organisations.[66] However, in recent years some universities in a few Muslim states (for example, Saudi Arabia, Pakistan, Egypt and Malaysia), have started making a few general courses on Islamic culture or ideology compulsory in engineering and technical education. But these are only partial solutions which could be dangerous if they merely lead to an entrenchment of secular philosophy in the curricula and in the content of educational literature. We need a general and comprehensive understanding of the problem.[67] An all out effort must be made to integrate Islamic values and ideology in the theories of social sciences and the humanities; and also for their integration in the philosophy, sociology, and policies of science and technology. One such unique experiment has been commenced with the

formation of the Department of Socio-Technical Studies, College of Engineering and Applied Sciences, King Abdulaziz University, Saudi Arabia.[68]

The realisation of the Islamic objective of Muslim peoples will ultimately depend upon its unequivocal adoption by political decision-making processes of legislation and administration. These instruments of state power must implement the Islamic objective through educational and other social institutions. We present below a brief comparative survey of engineering education in Communist, Western, and Muslim countries. A general outline of the structure and content of the subjects to be taught in the humanistic-social sciences stem of engineering education, oriented to conform with Islamic perspectives, is also presented.

The scientific-technological and humanistic-social sciences disciplines of engineering education, and technical education in general, must be adapted to Islamic ideology and institutions. This should be so in both the *sharī'a*-susceptive and universal rational realms of all these disciplines. Our discussion below will concentrate on the *sharī'a*-susceptive realm of undergraduate engineering education. This refers mostly to the teaching of humanistic-social sciences and, to a limited extent, the scientific-technological subjects in undergraduate engineering education.

Humanistic-social sciences stem of undergraduate engineering education in non-Islamic states

According to UNESCO studies, humanistic-social sciences are taught with purposeful thoroughness in engineering schools of the developed nations in the context of their ideology and civilisation.[69] Communist countries inculcate in their engineers Marxism-Leninism, the 'scientific dialectical materialist world-view'. The following subjects in social sciences and humanities are taught at Soviet higher technical schools; the figures in parentheses are the total number of hours devoted to lectures and seminars.[70]

First year:
1 History of the Communist Party of the Soviet Union (100 hours)
2 Marxist Ethics (24–32 hours)

Second year:
3 Marxist-Leninist Philosophy (70 hours)
4 Marxist-Leninist Aesthetics (24–32 hours)

Third year:
5 Fundamentals of Scientific Atheism (24–32 hours)
6 Marxist-Leninist Political Economy (110 hours)

Fourth year:
7 Fundamentals of Scientific Communism (70 hours)

The lecture-seminar hours listed above are equivalent to about 25 semester or 35–40 quarter units. Excluding time devoted to languages, this amounts to about sixteen to twenty per cent of the four-year engineering curricula. Discussing the aim and philosophy of engineering education, and the justification for humanistic-social sciences like 'Marxist-Leninist Political Economy'; the Deputy Director of Social Science Teaching of a USSR education ministry states:

> Soviet higher technical schools train engineers capable not only of technical but also of economic leadership. This makes it incumbent upon engineers to have profound knowledge of political economy, economics, fundamentals of scientific planning, etc. . . . Soviet technical higher schools train specialists not only in engineering but also in social activity. It is no mere accident that many graduates of higher technical schools participate in the management of production, in the administration of the State and in the work of public organisations.'[71]

The course on the 'Fundamentals of Scientific Atheism', according to our classification, is ideology-oriented or based on the 'Communist *sharī'a*'. Referring to this course and the general Marxist orientation of 'universal rational sciences', the Soviet authority states:

> The Marxist world outlook is atheistic. . . . The students receive an atheistic education not only within the framework of the special course. Such general theoretical subjects as physics, mathematics, and chemistry are also taught in the higher technical schools from an atheistic standpoint. During the lectures and practical studies the teachers devote special attention to the atheistic aspect of teaching.[72]

Similarly in advanced Western countries like France, the Federal Republic of Germany, Sweden, the UK, and the USA, humanistic-social sciences are taught to engineering students in the context of the 'Western *sharī'a*', or Western civilisation. These sciences are taught from secular and naturalist standpoints, in full harmony with their national ideological outlooks and their economic, technological, legal, political, and other social realities. In Japan such subjects are taught in conformity with its cultural outlook and national interests. (The descriptions of these courses taught in Western countries kept their ideological roots in Western Weltanschauung or world-view latent and implicit. One gets the impression that economics, for example, taught in the USSR is honestly self-admitted 'Marxist-Leninist Political Economy', but the economics taught in Western countries is, presumably, 'modern' economics of universal validity!)[73]

The American Society for Engineering Education, or ASEE (formerly, the Society for the Promotion of Engineering Education), has been

sponsoring studies on the humanistic-social sciences stem of engineering education since 1918. Since it released the Report of the Committee on Evaluation of Engineering Education in 1955, the ASEE has consistently recommended that about one-fifth of the undergraduate curriculum be devoted to the teaching of humanities and the social sciences. The Engineers' Council for Professional Development accredits engineering programmes of colleges in the USA. It specified in its 1971 accreditation criteria that, whether the undergraduate curriculum is of three or four years' duration (six or eight semesters), an equivalent of one full semester's work be devoted to humanities and social sciences. The figures show the US national average of the percentage of engineering curricula devoted to humanistic-social sciences courses over a period of a century.

	%
1870	29.1
1923	16.7 (including free electives)
1939	16.0
1949	14.5
1955	14.7
1959	17.0
1961	18.3
1968	15.0
1973	17.0

Some of the most prestigious and largest universities and engineering colleges whose graduates eventually supply a large number of top-ranking professionals, managers and leaders in academe, industry and the government, have a higher than the national average percentage of undergraduate engineering curricula devoted to humanistic-social sciences. These include, for example, Stanford University, California Institute of Technology and Carnegie Institute of Technology – twenty-five per cent; Massachusetts Institute of Technology – seventeen per cent; and Purdue University – sixteen to nineteen per cent. A national survey of engineering schools showed that the actual enrolment by students gave the following preference in social sciences in a descending order: economics, history, psychology, political science, sociology, geography, law, anthropology, and public administration. The humanities subjects of study included English, speech, literature, languages, philosophy, religion, and the fine arts."

The aims and achievements of US engineering education, regarding inculcating the Western-American world-view and values, and making engineers capable of taking managerial and leadership positions in industry and government, are substantially similar to the one claimed by the USSR in the Marxist-Leninist context.

In recent years most of the US colleges of higher technical education,

engineering or medicine, have started offering courses at the interface of values, society and technology. Many universities have instituted a well-designed series of courses or programmes, instead of isolated courses. These programmes afford the opportunity to undergraduates, and graduates, to study systematically the interactions between Western values, US social problems, and technology as a minor field of specialisation along with their major technical field of specialisation in engineering or medicine. In some universities they can take a second concurrent degree in such a programme along with their first degree in conventional technical engineering or medicine. The American Association for the Advancement of Science has published a Directory of these programmes and the description of their individual courses, which indicates the interest at present in the relevance of ethics and values in science and technology.[75]

After the 'Cultural Revolution' in 1966 in the Peoples' Republic of China, Tsinghu University, Peking, became a pioneer and model in technical education for the country. Students were required to spend seventy-five per cent of their time in classes studying technology; ten per cent studying military affairs, and working in agriculture on collective farms and in factories; and fifteen per cent in cultural and political studies centered on the thoughts of Mao Tse-tung. A move towards some far-reaching changes in the structure and content of engineering education was started in the wake of the recently adopted goals of the 'four-modernisations', that is, the modernisation of industry, agriculture, defence, and science-technology. The work study-programme is being phased out, the science-technology components of technical education are being up-graded and, though not the Marxist-Leninist ideology, the 'thoughts' of the late Chairman Mao are being down-graded.[76] However, all Communist countries, industrialised or less developed, make Marxist-Leninist indoctrination an all-pervasive and significant component in their technical education.

The UNESCO and other studies show an initial neglect, but a growing interest, during the last three decades in the teaching of humanities and social sciences in Indian technical education. This is, perhaps, typical of many developing countries where the neglect and down-grading of humanistic-social sciences in technical education of the under-developed countries is unwarranted. It will not contribute to the growth of science and technology, and to general socio-economic and industrial development. Sorokin, a sociologist of culture and science, made a computer analysis of data obtained from encyclopaedias related to the Islamic civilisation (AD 700–1300), and the Greco-Roman and Western civilisations (600 BC/AD 1900). He devised quantitative 'indicators' that measured the movements in scientific discoveries and technological inventions as well as indicators for creativeness in humanities, philosophy, religion, and music. These indicators were found to move in the same direction.

Thus the history of science and civilisation shows that in all nations and civilisations science-technology (material-technological culture), and humanistic-social sciences (ideological, or non-material culture), grew or declined simultaneously. One can not be developed without the other.[77]

Humanistic-social sciences stem of Islamic engineering education: structure and subject matter

Engineering education for Muslims, in the Muslim-majority as well as the Muslim-minority countries, needs radical curricula reforms in its structure and the content of the subject matter. The basic pre-requisites of the Islamic curricula are:

(i) inculcation of the Islamic world-view in the Muslim students in Islamic or non-Muslim states;

(ii) provision of institutionalised educational opportunities for the non-Muslim minorities in Muslim states to foster their own world-views;

(iii) freedom for Muslims and non-Muslims to study subjects from a perspective different from their own traditional world-view.

The Islamic engineering curricula must incorporate two primary and permanent values: the fundamental unity of the Islamic community of values in space and time; and the unity of the international community of technological interests comprising culturally disparate segments of mankind. These values must be qualified by two secondary criteria: the unity of values may not extend to the realm of *fiqh*; and appropriate technology is constrained by the environmental, developmental, and economic factors which, however, might still allow regional groupings of nations or their parts which are not in geographical proximity. Engineering education must be developed to conform to the socio-economic, technological, and environmental conditions and requirements of each country in a way designed deliberately to foster regional co-operation especially in higher education, research and development.

The Islamic value-orientation of the curricula must provide a new sense of purpose and direction by making the faculty, students, and the professionals sensitive to the demands of Islamic science and technology policies. This would make the curricula relevant to national, regional, and global needs for development that is consistent with the environmental predicament. This Islamic engineering education would then become a viable alternate system in competition with the secular, Western, and Marxist systems of technical education and technological civilisations.

To accomplish these goals, the basic aims and methods; principles of curricula structure and subject matter content planning; and the philosophy of medieval Islamic general and technical higher education must be imitated, and adapted for modern needs. The crowning achievements of the medieval Islamic education system during the rise and world ascendency of Islamic civilisation were:[78] indefatigable *ijtihād* and research to reconstruct pre-existing sciences; philosophy; and technology

in conformity with Islamic ideology and its sociological perspectives. Then the development of these on uniquely Islamic lines; the use of education to transmit and establish the ideal patterns of Islamic culture according to the orthodox as well as unorthodox Muslim viewpoints; deliberate encouragement of non-Muslims[79] to realise their distinct cultural aspirations by developing their autonomous educational institutions; integration of *shar'iyya* and the 'philosophical' sciences in the educational system[80] with a vew to fostering an integrated technical-humanistic personality so conspicuous in the universal figures of medieval Islamic science;[81] distinction between the realms of the *shar'iyya* and rational/'philosophical' sciences, but subordination of *scientia* (rational, human or 'philosophical' knowledge) to the value-judgements and social purposes of the *sharī'a* or *sapientia* (divine wisdom);[82] and an organic relation between science and technology, and the personal and social ethics of Islam. Some of these salient features of Islamic educational philosophy were brought out in the summary of the expositions by al-Ghazali and Ibn Khaldun.

It is not possible here to describe the principal components of the undergraduate and graduate engineering curricula in the ideological and sociological setting of Islam for all the countries inhabited by Muslim minorities and majorities. Muslims can learn a great deal through 'stimulus diffusion' from a study of the past state and present trends in engineering education, particularly its humanistic-social sciences stem, in the developed countries.[83]

In adapting the engineering education of the developed countries for the underdeveloped Muslim majority and minority countries, new significant knowledge will have to be added. Those items which are unrelated or insufficiently related to Islamic culture and ideology, and to the socio-economic and scientific-technological environment and needs of each developing nation will have to be removed or modified. Some rare efforts have been made in the Western countries to orient engineering curriculum and research towards solving the problems of the less developed countries within the setting of their social-technological environment and with an awareness of their culture and institutions.[84] There are many possible *sharī'a*-susceptive subjects that can be included for an Islamic engineering education specialising in, for example, water resources engineering systems planning.

A sequence of courses on 'Islamic law' might commence with a survey of the principles, philosophy, and history of Islamic jurisprudence (Chapter 2); elaborate their implications for general engineering law and water law (Chapter 4), or other specialities such as labour law, construction and zoning codes and environmental protection. In the reconstruction of modern 'Islamic economics', the doctrines and value judgements of Islamic ideology must be superimposed on the universal rational aspects of economics, such as in the *sharī'a*-susceptive assumptions used in

engineering economy methods of project evaluation (Chapter 4).

We present below the outline of a few *sharī'a*-susceptive sciences which should be included in undergraduate and/or graduate Islamic technical curricula. These subjects could be suitably expanded into a sequence or sequences of courses. The strategy for transmission of *sharī'a*-susceptive sciences, and the transfer of science and technology to developing Muslim peoples is also presented.

Islamic philosophy and sociology of science and the history of (medieval) science and technology. The various engineering, natural or physical, mathematical, communication (including languages) and social sciences, humanities, and technology, comprising the principal components of engineering curricula, subsume an Islamic epistemology, and philosophy and sociology of science. Islamic philosophy of science and learning commences with the postulates of Islamic monotheism and Islamic naturalism; the knowability of God's will through the *sharī'a*, and the physical and humanistic-social ('philosophical') sciences; and the determination of all causation ultimately by the will and purpose of God. This purports a purposive and perfectable universe, and goal-seeking activities for individuals and society. Regarding the factors and social processes responsible for the origin and development of science and technology, Islamic sociology of science and knowledge enables and encourages selective assimilation through a conditional resort to borrowing and adaptation, and innovations through *ijtihād*. These constraints and principles are explicit in the fundamental principles of the *sharī'a* (Chapters 2 and 4). Thus sociology of science brings us into intimate contact with Islamic internal as well as international law.[85]

One of the basic causes for the decline of the medieval Islamic science and civilisation was the destruction of the Muslim lands conquered by the non-Muslim barbarian Turks, Tartars, and the Central Asian Mongols (Chapter 2). But during the AH fifth to eight/AD eleventh to fourteenth centuries, the sons and grandsons of these barbarians, as devout Muslims, made great efforts to revivify Islamic science and civilisation which their fathers had so relentlessly destroyed. Thus Western Asia was reconsolidated into one Muslim state in the second half of the AH fifth/AD eleventh century under the Muslim Turks of the Saljuk dynasty. 'The story of these barbarian infidels, setting their feet on the necks of the followers of the Prophet and at the same time accepting the religion of the conquered and becoming its ardent champions, was not a unique instance in the chequered annals of that religion.' The same history was repeated by the Mongols and Ottoman Turks in the following centuries. 'Less than half a century after Hulagu's (d. AH 664/AD 1265) merciless attempt at the destruction of Islamic culture, his great-grandson Ghazan, as a devout Muslim, was consecrating much time and energy to the revivification of that same culture.' In the reign of Ghazan (AH 694–704/AD 1295–1304), Islam became the state religion of the Mongol empire.[86] Not

only had such barbarian races and peoples poured their blood into the struggle of Islam for world supremacy in science, civilisation, and political power. The civilised nations and diverse religious peoples of the Sassanid and Byzantine Empires conquered by the Arabs, re-formed by the Quran and the Prophet in the AH first/AD seventh century, became the founding-fathers of the *sharī'a*, and the Islamic rational sciences and civilisation. The most important cause for the flowering of the potential talents of the creative individuals among these diverse races and peoples was the *sharī'a*, 'the fact that acceptance of Islam automatically conferred citizen rights in a vast and flourishing civilisation'.[87] But the *sharī'a* is internal and international law (Chapters 2 and 4) as well as the 'state of the heart' overtly expressed in personal and social ethics. Therefore the *sharī'a*, when implemented, had curtailed the two great enemies of social and scientific progress, the individual's propensity towards evil against his own self (*al-nafs al-ammāra*) and the social group (*'aṣabiyya*, Chapters 5 and 7). These individual and socio-political character traits cause geographical and linguistic nationalisms, racism, amoral power group and familial loyalties, that is, ascriptive and particularist role-patterns in socio-political systems (Chapter 7). The *sharī'a*, when implemented, had internationalised the Muslim states and societies and granted uniquely Islamic human and citizenship rights to all neo-Muslims and non-Muslims. These provided the fundamental political and socio-economic, or cultural, policies that are essential for the genesis and growth of the *shar'iyya* and rational sciences, and technology.

The notion of the 'miracle of Arabic (Islamic) science'[88] circulated most unfortunately by Sarton, the historian of medieval science, is false. The sociologist of science must seek the explanation of this alleged miracle in the living Islamic ethos of those times; its dogmas and its gamut of culture; the all-pervading Islamic law which forged strong bonds of social co-operation among the Muslims; and between the Muslims and non-Muslims, citizens and resident aliens of the vast Islamic society of bewildering religious, ideological, national, racial and linguistic diversity.[89] It was this Islamic ethos in action which rekindled the dying embers of the pre-Quranic ancient sciences and world-wide civilisation. On account of the intensely developed Islamic consciousness and conditioning, based on a remarkable Islamic system of education, the Muslims absorbed the best in the existing sciences and civilisations consistent with Islam and developed them. There was great flexibility in horizontal and vertical mobility of people as nationalistic and hedonistic evils were held in check. The pre-requisites of science and civilisation are adaptive-creative diffusion; invention and innovation based on original thought; social-mindedness and utilitarianism of individual efforts as well as in the organisation of the state and its educational and other programmes; political stability; the rule of law and constitutionalism. These mechanisms and conditions are indispensable for the genesis, development,

diffusion, and application of science and technology. These mechanisms become operational only in a cultural and political milieu of propitious dogmas, laws, values, cosmological doctrines, attitudes and efforts, which existed in the progressive period of medieval Islamic civilisation.

Engineering education must bring out the importance of, and the need to take lessons from, the history of science and civilisation. Sarton often explicitly mentions the 'intellectual supremacy' of Muslims for about 350 years from about the middle of the AH second/AD eighth century to the end of the AH fifth/AD eleventh century. He considers the AH sixth and seventh/AD twelfth and thirteenth centuries as a 'period of transition', 'absorption and fusion'. Since the dominant activity in the West during the latter two centuries was imitation of Muslim intellectual and material culture – according to Sarton 'assimilation of the East by the West', this is also the period of Muslim intellectual supremacy in the world. Thus Muslim education must particularly emphasise the Islamic origins of modern science and civilisation, and the ascendency in the world of Islamic science and learning for about 600 years (AH second to seventh/AD eighth to thirteenth centuries).[90] This will show the compatibility of the growth of both the technological and ideological cultures with Islamic culture, and provide a historical-sociological justification for contemporary rejuvenation of Islamic culture. The consequences of the denial, falsification and neglect of this historical fact have been extremely serious: the denigration of Islam in the eyes of Muslims and non-Muslims; the identification of Islam and its culture with ignorance and backwardness and of 'modernity' and progress with Western civilisation and Communism; the creation of xenophobia and arrogance in Western and Communist minds, and the perpetration of ideological and politico-economic Western and Communist imperialism against Muslim peoples; the imposition of an inferiority complex among Western and Marxist educated 'modern' Muslims, and the bitter social and political cleavages between the 'modern' and the 'traditional' Muslim elites.

Once the facts of the history of science and technology are known, with emphasis on medieval Islamic civilisation and its interpenetrations into preceding and following Western and Eastern civilisations, the reactionary tendencies so widespread among Muslims towards apology and historical romanticism must be systematically avoided.[91] The main purpose of the study of the history of science and civilisation must be sociological:

1 to understand and revive those principles of Islamic philosophy and sociology of science and *sharī'a* which enabled the nascent Islamic society of the AH first and second/AD seventh and eighth centuries and thereafter, to absorb and assimilate the universal rational sciences of the Greco-Hellenistic, Syriac-Alexandrian, Sassanid (Persian), and Hindu (including other Indian) civilisations; and to understand the classical Islamic legal methodology which reconstructed and

developed on the foundations of these civilisations the superstructure of the international medieval Islamic science and civilisation;

2 to understand and adapt the principles of the sociology of science and technology, manifold social change and development, which caused the emergence of the West from its Dark Ages through contacts and conflicts with, and imitation and assimilation of, medieval Islamic science, philosophy, and civilisation;

3 to discover the internal and external causes of the decline and destruction of the medieval Islamic science and civilisation;

4 to establish the sociological causes of why the successor Muslim world-states like the Ottoman Empire (AH 699–1343/AD 1299–1924), the Persian Safawid Empire (AH 907–1135/AD 1501–1722), and the Indian Mughal Empire (AH 933–1273/AD 1526–1857) which were economically, politically, and militarily very strong at the height of their power, were comparatively mediocre in cultural achievements in science and technology, law and philosophy;

5 to remedy those internal and external causes, *ipso facto* unIslamic, which are a barrier to development; and to inculcate those requisites of Islamic culture which are conducive to creative social transformations, and adaptation and assimilation of modern science and technology in conformity with the permanent values of Islam (*sharī'a*).

Thus the history of science, Islamic philosophy and sociology of science and learning, and other cognate disciplines must be studied with the main purpose of gaining the ideological and sociological Islamic consciousness of why a Muslim should do what he must do as an engineer. This consciousness must be translated into policies and plans of action in the fields of education and research; development of man-power, especially brain gain with regard to emigrated Muslims as well as alien non-Muslims; the political and economic rights and privileges of socially useful individuals, groups and institutions.

Islamic ethics inculcation of creative, altruistic professionalism. Modern Western and Marxist-Leninist natural, and even social sciences concentrate on their quantitative and material aspects.[92] The characteristics of Western and Marxist-Leninist 'ideal' culture mentality include amoralism, nihilism, hedonism, and individual intellectualism. According to Ibn Khaldun's typology (Chapter 5), this is a 'rational' culture (that is, secular or atheistic, and materialistic), at its best devoted unilaterally to man's sensate needs and ends. According to Sorokin's typology of cultures (the ideational or other-worldly, idealistic or integrated, and sensate), Western culture is sensate.[93] The attitudes of these cultural mentalities towards scientific-technological progress, and socio-economic development in general, are not helpful in the development of backward nations and intra-national groups. The very nature of such cultural mentalities militates against the re-allocation of resources, and redistribution of income, wealth and power in favour of the poor and the deprived. The Communist

states try to solve some of these problems politically by resorting to an efficient system of nemesis,[94] or force and political retributions. The new states of the Third World countries, whether they have followed the Marxist-Leninist or Western-secular model, have been successful in strangling man's many freedoms, and creating their own 'new class' of hedonistic technical and political ruling elites.[95] 'Brain drain' from the under-developed countries; the public and private spending priorities in development, defence and internal security; even their wasteful investments in education and research are due to preference for special interests over public interests, and the egotistic preferences of the elites over the socio-ethical objectives of national planning.[96]

An Islamic solution to this problem of development consistent with social justice and human liberty is to condition men to the Islamic system of education which brings technical expertise into an organic relationship with the profound ethical system of Islam and subordinates *scientia* to *sharī'a*. It puts into practice the Quranic belief in the improvement of man through deliberate and relentless efforts to hold in abeyance his greed for material gains, and to awaken his moral and ethical potentialities. An aspect of this is the call to develop creative, altruistic, technical humanism (Chapter 1). Another aspect of it is al-Ghazali's detailed exposition of the ethical ethos of Islamic epistemology and education system.

It is outside the province of statutory laws and administrative rules to prevent the offences, enumerated in al-Ghazali's 'science of the states of the heart', such as despising the poor and the powerless, and currying favour with the rich and powerful. Laws and rules invoked in the context of an atheistic or secular Weltanschauung are inadequate for optimum inhibition of evil propensities such as manipulation of data to influence decision-making and the abuse of political and bureaucratic power by ruling elites. Islamic ethics should play a dual role in this and in those concerns of administrative science such as personnel motivation, control, responsibility and accountability. Islamic law and ethics encompass juridically cognisant areas of man's public and private life as well as those areas of his consciousness and covert behaviour which are beyond the scope of accountability to human law. This is due to the nature of the restraining powers, and promises of rewards and punishments employed by Islam since it is founded on affirmation in God, the hereafter, and His judgements (Chapter 5).

Engineers have become an increasingly powerful group of technocrats, bureaucrats, political-economists, users of resources, and spenders of wealth in academe and industry, government and private management. As agnostic or atheist strategists of development they can be imbued with only politico-economic and technical materialistic justifications from the viewpoint of the donors', investors', and decision-makers' this-worldly interests. These justifications are counter-productive or insufficient to

meet the needs of the poor, and the underdeveloped classes and nations, for rapid development through massive transfers to them of land, capital, technology, and the skills for organisation and entrepreneurship. Islamic culture provides additional justifications, and purer and more powerful motivations for creative altruism which is 'neglected by all' in the list of resources and factors required for development. Without al-Ghazali's 'science of the states of the heart' engineer-managers become hedonists, hacks for self-seeking ruling elites, and tools in the service of aggrandising national interests of the rich and developed countries.

Indoctrination of Islamic ethics in engineers and their Islamic socialisation must be undertaken through formal education as well as the practice of socio-religious duties prescribed by 'individually obligatory' sciences, and the 'socially obligatory' *sharī'a*-susceptive sciences and types of social action. The indoctrination in Islamic social ethics through formal education should be undertaken by bringing out its applications in engineering design and appropriate technologies whose target beneficiaries are explicitly identified; in the planning and management of engineering projects; in the allocation of resources and incidence of socio-economic costs and benefits of projects; and the consequences in restructuring the society according to a new socio-economic and political order, and a new ecological and environmental order. Islamic ethics should not be limited to personal ethics, and to sermons and philosophising on inconsequential and non-controversial subjects.

Transfer of science and technology, and the transmission of sharī'a-*susceptive sciences.* The *sharī'a* juridico-sociological and educational policies indispensable for the transfer and adaptation of modern science and technology, and innovation in them, are both explicit and implicit in our discussions in Chapters 1 to 4. Stress is laid on the importance of a continuous programme of translations as a mechanism of transmitting knowledge. Modern works in the universal rational sciences and technology must be continuously translated into major indigenous Afro-Asian languages. Engineering education and research must be conducted in the major Afro-Asian languages.

However, distinction might be made here between higher or post-graduate education and research and, on the other hand, undergraduate university and other types of lower education in engineering and technology. For a faster transfer of knowledge, and due to economic and other considerations, polyglotism and the knowledge of the languages of the advanced countries will be a functional necessity for post-graduate engineering education and research. The following discussion emphasises the role and the need for translations for the vernacularisation of education and transmission of knowledge and technology.

Translations into Arabic of works in the natural and mathematical sciences and technology, and later on philosophy; from Greek, Syriac, Pahlavi, and Sanskrit from the second half of the AH second/AD eighth to

the end of AH third/AD ninth centuries laid the foundation of the adaptive-creative age of medieval Islamic science and learning. Similarly the main intellectual task of the West for 200 years in the AH sixth/AD twelfth and AH seventh/AD thirteenth centuries, and to a lesser degree for another 200 years in the AH eighth/AD fourteenth and AH ninth/AD fifteenth centuries, was not so much the creation of new knowledge but the absorption and assimilation of existing Muslim knowledge. Apart from other forms of primary and secondary diffusion for transmission of knowledge, skills, and character traits, this was accomplished through translations mainly from Arabic into Latin and other European languages. From the point of view of developing nations, the social costs of translating and publishing scientific and technical textbooks, and other necessary literature in indigenous languages must be much less than the costs of imparting undergraduate technical education in English, French, or Russian. At the outset vernacularisation of at least undergraduate and lower level technical education would facilitate overcoming a shortage of intermediate level and paratechnical personnel. This would be the only way to transmit scientific-technological knowledge to such users as farmers, mechanics and agricultural extension workers, among whom adequate knowledge of the languages of the developed countries rarely exists. Historically, Anglicised and Gallicised elites in the underdeveloped countries have often been a deculturised minority; in their knowledge and aspirations, aliens to their own cultures and nations. They became, by and large, blindly imitative, and uninspiring 'Herodians' (for example, the 'Westernised Muslims' and the 'Marxist Muslims').

Technical education and research interests acquired in developed countries by students from underdeveloped countries are often irrelevant for their own countries. Such students become misfits or a socio-economic burden in their own countries, or an emigrant 'brain drain' statistic.[87] The reason why the achievements of the Ottoman, Safawid, and Mughal Empires remained at best mediocre in intellectual culture, compared with the earlier Muslim achievements or those of the contemporary West, could be explained by the fact that the medieval Islamic and the post-medieval Western scientific-technological and humanistic-social sciences were not translated into the indigenous languages of the non-Arabic speaking Muslim peoples, and so were not disseminated and developed through a system of education and research. The gulf between the ideal patterns of Islamic culture and the actual cultural patterns of non-Arabic-speaking Muslims has always been wide in comparison with Arabic-speaking Muslims. Their societies have remained mediocre and traditionally Muslim but substantively aborted Islamic civilisations.[88]

Succinctly, then, the transfer of modern science and technology requires translations of works mostly from the languages of the developed nations (Western, Communist, Japanese), into the languages of Muslim Afro-Asian peoples. The transfer of the *sharī'a*-susceptive knowledge

demands translations of Islamic classical as well as contemporary works from Arabic (also Persian, Turkish, Urdu) into the indigenous languages of other Muslim peoples, and *vice versa*. In view of the fact that the problems of the underdeveloped countries receive little attention in research programmes and priorities in the developed nations,[99] part of their research will not be adaptable to the natural environment and the immediate socio-economic and technological needs of the underdeveloped countries. Conversely, economic development strategists have rightly pointed out the possibilities of technological imitation of the developed countries by the underdeveloped countries in their position as late-comers in the race for development.[100] The results of applied research and socio-technical experiments undertaken in an underdeveloped country might be readily transferable in other similar countries. These considerations call for planned transfer of 'universal rational sciences' and technology vertically from the more or less developed countries, and horizontally among the underdeveloped countries. There must be regional, pan-Islamic, and international exchange, and communication of the *sharī'a*-susceptive knowledge among Muslim peoples and nations.

Discussion

The structure and subject matter of engineering curricula were discussed in this section from Islamic ideological perspectives. Another facet of the Islamic education system is the opportunity it provides for non-Muslims to foster their own world-views by developing their autonomous, self-governing, educational institutions. An optimal solution to implement this fundamental *sharī'a* right of non-Muslims in an Islamic state, would be to offer parallel courses in humanistic-social sciences in technical institutions for students interested in non-Islamic perspectives – secular, Marxist-Leninist, Christian, Hindu, Buddhist and Jewish. Such an Islamic educational system might well be adopted in all those non-Islamic countries of the world which cherish the value of freedom of thought and choice. This will meet the legitimate demands of national minorities for cultural, ideological and religious autonomy; and promote national stability and international peace through unity of polities in cultural diversity. The historical Muslim world-states have followed this principle during the last 1400 years.[101]

The system of education in the USA based on credit units for each course studied, and requiring a minimum total credit units for each degree, is suitably flexible to serve these Islamic ends of curricula organisation. In fact, it is similar to the medieval Islamic system of education when students moved from professor to professor, to study a course or subject and earn an *ijāza* (certificate of proficiency) from an expert.[102] In such a system the required, or compulsory, courses for all students of engineering, Muslim and non-Muslim; will be the universal rational sciences which comprise, in particular, the scientific-

technological stem of engineering education. The elective, or optional, courses, comprising in particular the humanistic-social sciences stem, will be those belonging to a specific *sharī'a*-susceptive realm; or a combination of diverse ideologically-oriented realms, catering to those interested in non-Islamic perspectives. In an Islamic state, however, only the Islamic orientation of both humanistic-social and scientific-technological stems of engineering will have practical significance in government, and all other public matters of engineering education and professional practice.

4 Implications of Islamic jurisprudence for environmental engineering systems planning: the case of water law

Introduction

The discussion in this chapter follows our division of Islamic jurisprudence in Chapter 2. We shall consider the implications for environmental engineering systems planning of the sources of *sharī'a* and *fiqh*. We recall that the *sharī'a* comprises the explicit texts of the Quran, and the 'legal, binding *Sunnah*'. *Fiqh* is the changeable, time-place constrained Islamic substantive law devised by Muslims consistent with the *sharī'a*. Our aim is to elucidate the principles and methodology for developing a basic legal code for public works planning. Illustrations will be given from the field of water resources engineering.

We concluded in Chapter 2 that the heart of the *sharī'a* philosophy is its strategy of social development through assimilation by innovation and selective imitation with or without reforming, improving, and adapting the borrowings from the accumulated heritage of all mankind, Muslim as well as non-Muslim. The imitative-innovative processes are applied here taking into account contemporary social and technological conditions in the emerging Muslim countries which form a part of the under-developed world.

Implications of the sources of *sharī'a*

The Quran

The subject matter of the Quran includes broad and fundamental principles, and legally cognisable value-judgements (Chapters 1 and 2). These are pertinent to environmental engineering systems planning as basic maxims of the *sharī'a* encompassing legal, political, economic, educational, sociological, epistemological, philosophical and other issues. Some possible *sharī'a* legal maxims are enumerated below. The uses of these maxims to derive the sources of *fiqh* and as other fundamental legal principles are shown later. On the basis of these legal maxims, and other political and economic principles discussed in later chapters, the detailed temporal legislation and executive rules pertaining to engineering systems planning must be developed. The Quran also provides the basic

principles of the overall methodology for social change. These include such principles as *tadrīj* (gradualism) and the allied concept of *taysīr* under constraint or necessity.

The Quran and *sharī'a* do not go beyond fundamentals and generalities. The Law-Giver, God, knows that undue specificity will make the *sharī'a* rigid and insensitive to the requirements of changing times. Thus there is no detailed positive legislation in the Quran pertinent to environmental engineering systems planning as is found for a few issues in family law. The Quran deals not with facts but values – the *shar'iyya* sciences, and the *sharī'a*-susceptive realm of the non-*shar'iyya* science-technology and humanistic-social sciences (Chapter 3).

The 'Legal, Binding Sunnah'

Chapter 2 discusses the limitations on the authority and time-place universality of the *Sunnah*. Ibn Khaldun's treatment of the sources, nature, subject matter, and methods of the *shar'iyya* and universal rational or 'philosophic' sciences (Chapter 3) implies that when the *Sunnah* deals with the universal rational realm of science, technology, and the humanistic-social sciences, where *sharī'a* values are not directly at stake; the *Sunnah* should be over-ruled in the light of more modern knowledge. The technologically and sociologically more sensitive *sharī'a* principles such as *al-maṣlaḥa* and *istiṣlāḥ* will be more authoritative than the prophetic *Sunnah*. Functionally, such prophetic decisions (*Sunnahs*) will enjoy the status of a *fiqh* ruling: human, changeable, and time- and space-bound.

This subject is important because conclusions derived about the Prophet's *Sunnah* have implications for the contemporary relevance of Muslim tradition *per se* – Muslim traditional or customary law (*'urf*) applicable to environmental engineering systems planning; the entire *fiqh* in general; and the traditional physical and natural sciences developed by generations of Muslims. Our discussion of the *Sunnah* is confined particularly to the subject of *ḥarīm*, the reserved or protected, private or public open space around a water source. This subject is not dealt with in the Quran. The Prophet Muhammad dealt with this question as a common mortal in his administrative and adjudicative decisions as head of the Islamic state at Medina, instead of in his prophetic capacity.

According to the *Majallah*,[1] the first partial codification of traditional Muslim civil law, the *ḥarīm* of a water supply well is an area circumscribed by a radius of forty cubits[2] (*Majallah*, Arts. 1281–1287). The *ḥarīm* land is the private property (*mulk*) of the owner of the well; no other person can exercise control over it in any way (*Majallah*, Art. 1286). However, all people, and after them cattle, have the right to drink from any water source, including those on private property (*Majallah*, Arts. 1263, 1266–1268).

These laws are traced back to precepts and decisions of the Prophet Muhammad. Some of the relevant prophetic Traditions according to different chains of transmitters of the *Sunnahs* are:

> The *ḥarīm* of a well is 40 cubits on every side to afford the camels and sheep a rest, and the wayfarer the first drink, and the surplus water should not be withheld to prevent the grass (from growing).
> The *ḥarīm* for an ancient well is 50 cubits; that for a new well is 25 cubits.
> He who digs a well is entitled to 40 cubits around it as a place for his cattle.
> The Muslims are partners in grass, water, and fire.
> The original rights of ownership in land are God's and His Prophet and then to you. But he who revives dead land has the right of ownership to it[3]

The last two *Sunnahs* explain the oft-repeated Quranic verses declaring God's ownership of all the resources of the earth and heavens; that is, for all practical purposes, they are first owned by the state or the community, represented by the Prophet as the head of the state, and secondarily by individuals through ownership or usufruct subject to the limitations imposed in the interests of the community.[4]

The Muslim rulers and jurists coming after the Prophet in the first/seventh and second/eighth centuries modified, revoked, and expanded the decisions of the Prophet according to new exigencies. They set different limits on the *ḥarīm* of springs, irrigation wells, canals and streams, great rivers, qanats, etc. There was no *ijmā'* among these jurists regarding the extent of *ḥarīm* for each kind of water source.[5] Malik b. Anas held that the *ḥarīm* should be without any fixed limit beyond that needed to prevent damage to the well. In cities or reclaimed areas, if a person dug a well even in his private property, causing drawdown in the existing well of a neighbour, Malik maintained that the new well would have to be removed from its place. The *ijtihād* of Abu Hanifa was that wells in built-up residential areas cannot have any *ḥarīm*; but one should dig a new well so that it did not damage one's neighbour's. Another classical jurist, Sufyan b. Sa'id al-Thawri, maintained that a person may make any innovation within the boundaries of his *mulk*, irrespective of the damage caused to his neighbour.[6] This *ijtihād* of al-Thawri was adopted in the Ottoman Civil Code (*Majallah*, Art. 1288) in the late thirteenth/nineteenth century. This Article does not consider it necessary to do anything if a new well, bored outside the *ḥarīm* of an old well, dried up the latter.

The Second Rightly Guided Caliph, Umar ibn al-Khattab (d. AH 24/AD 644), took such a serious view of the 'right of thirst' that he sanctioned the use of force against the proprietor of water who prevents an individual from quenching his thirst. When a group of men refused water to a man who later died of thirst, Caliph Umar made them responsible for his blood-money. The prophet had given away a large tract of land to Bilal b.

al-Harith al-Mazani. Caliph Umar confiscated the portion of the land which Bilal had failed to cultivate himself and distributed it to others. Since then Islamic jurists have believed in the right of the state to confiscate without compensation the excess land in the possession of an owner who cannot cultivate it personally.[7] Like the principle of cost-sharing for the maintenance of small channels which are owned as common private property, and the use of state revenues exclusively to develop and improve rivers; later *fiqh* laws pertaining to water resources are based mostly on the private expert opinion of the great jurists of the first/seventh and second/eighth centuries such as Malik b. Anas, Abu Hanifa, Abu Yusuf, Muhammad al-Shaibani, Zufar ibn al-Hudhayl ibn Qays and Sufyan al-Thawri.[8]

Thus we see that these laws, administrative rulings, and judicial decisions of the Prophet Muhammad pertaining to water and related land resources were not irrevocable like the *sharī'a*. They were modified or revoked by Islamically motivated Rightly Guided Caliphs and jurists because, as Ibn Khaldun would put it (Chapter 3), these *Sunnahs* were not extra-rational judgements of value or metaphysics where the Prophet has a unique competence unavailable to men who are dependent entirely on rational modes of knowledge. That the Prophet Muhammad himself did not consider such decisions 'legal, binding *Sunnah*' is apparent from his reported *Sunnah*: 'The Prophet entered a garden of one of the Anṣārs as they were pollinating palm trees. He said: Will this achieve anything? So they left off, and the palm trees did not bear fruit. Said the Prophet: Do it again! I merely said so without knowledge.'[9] According to a second version by another chain of transmitters, the Prophet said: 'If it is of any advantage let them do it! It was merely a thought that occurred to me, but I did not say it in the name of God, for I will never proclaim in the name of God what He has not ordained.' This statement of the Prophet is extremely significant. It describes the nature of the immutable Quran and the scope of the 'legal, binding *Sunnah*.' The Prophet was merely reaffirming in his own words the repeated condemnation in the Quran against arbitrary extension of the realm of the immutable *sharī'a*: 'And utter not, for what your tongues describe, the lie: This is lawful and this is unlawful; so that you forge a lie against God. Surely those who forge a lie against God will not prosper.'[10]

The water and related land resources laws of the Prophet, and of the later Islamic rulers and jurists reflected, on the one hand, their understanding of hydrology, climatology, sociological and economic realities of their times and, on the other hand, their deductive understanding of pertinent *sharī'a* principles. Therefore, these traditional laws, even when associated with the name of the Prophet, are revocable and amendable inasmuch as legislation must be compatible with the best available geophysical data and sociological facts. However, public interest as well as individual and correlative rights, the ideological premises and value-

judgements subsumed in the water laws of the Prophet and other jurists, are ideally immutable. The task of the Muslims of every generation must be to exercise *ijtihād* to reaffirm, rediscover, or reunderstand the *sharī'a*, and apply it through legislative consensus or otherwise as *fiqh* to specific social and technological situations.

Traditional Muslim water laws which belong at best to the *fiqh* category – such as those compiled by Caponera for the United Nations Food and Agricultural Organisation – are not sancrosanct. *Sharī'a* legal, political, economic, and other permanent values systematised as, for example, *sharī'a* water code alone would be sacrosanct, subject to allowance for reinterpretation of the Quran and the 'legal, binding *Sunnah*'.

The Majallah*: some possible* sharī'a *legal maxims pertinent to environmental engineering systems planning*

Muhammad ibn al-Hasan al-Shaibani (d. AH 189/805 AD), a student of both the School of Opinion (*ijtihād*) of Abu Hanifa in Iraq, and the School of Tradition (*Sunnah*) of Malik b. Anas in Medina, compiled a series of six books called the *Ẓāhir al-Riwāyah*, or books of primary questions. A committee of Islamic jurists was appointed in the Ottoman Muslim Empire to codify the Islamic civil code dealing with transactions between people. Relying primarily on the books *Ẓāhir al-Riwāyah*, this committee prepared the *Majallat al-Ankām al-'Adlīyah (The Corpus of Juridical Rules)*, or simply the *Majallah*. The *Majallah*, enacted into law for the Ottoman Empire in AH 1293/AD 1876, is the first modern legislated Islamic civil code.[11]

The following principal legal maxims are selected from the *Majallah*, Arts. 2–99, called its principles (*qawā'id*). These or similar legal maxims would most likely be included in any *sharī'a* code for environmental engineering systems planning, if it were legislated by an ideologically motivated and competent Islamic legislative assembly. These maxims should be read in conjuction with the *sharī'a* principles of state and government (Chapter 5), and public works economics (Chapter 6) in order to get a comprehensive view of the *sharī'a* principles of politico-economic planning of environmental resources engineering.

Later we shall show the uses of these *sharī'a* maxims as sources of *fiqh*, and their implications for environmental engineering systems planning. These maxims have their Latin and modern Western equivalents.[12]

Immutability of *sharī'a* texts:

'It is not permitted for lawyers to strive to arrive at the meaning of a point of law or religion, where there is a decisive text.' (Art. 14)

Presumption against change:

'The remaining of a thing in the state in which it was found is the presumption.' (Art. 5)

Custom:

'What is from time immemorial will be kept in its ancient state.' (Art. 6)

'Damage does not become of time immemorial.' (Art. 7)
Equitable relief (*taysīr*):
'Hardship (*mashaqqah*) begets facility. That is to say, difficulty becomes a cause of facility, and in time of embarrassment it becomes necessary that latitude should be shown.' (Art. 17)
'Latitude should be afforded in the case of difficulty. That is to say, upon the appearance of hardship in any particular matter, latitude and indulgence must be shown.' (Art. 18)
Torts:
'Inquiry (*ḍarar*) may not be met by injury.' (Art. 19)
'Injury (*ḍarar*) is to be repaired.' (Art. 20)
Necessity (*ḍarūra*), an excuse:
'Necessity (*ḍarūra*) renders prohibited things permissible.' (Art. 21)
'Necessities are estimated according to their quantity.' (Art. 22)
Cessation of excuse:
'Whatever is permissible owing to some excuse ceases to be permissible with the disappearance of that excuse.' (Art. 23)
Cessation of prohibition:
'When a prohibition is removed, the thing to which such prohibition attaches reverts to its former status of legality.' (Art. 24).
Damage:
'An injury (*ḍarar*) cannot be removed by the commission of a similar injury.' (Art. 25)
Choice between conflicting interests (*istiḥsān*):
'A private injury (*ḍarar*) is tolerated in order to ward off a public injury.' (Art. 26)
'Severe damage (*ḍarar*) is made to disappear by a lighter damage.' (Art. 27)
'In the presence of two wrongful acts (sing. *fasād*), the one whose injury is greater is avoided by the commission of the lesser.' (Art. 28)
'The lesser of two evils (sing. *sharr*) is chosen.' (Art. 29)
'The repelling of mischief (pl. *mufāsid*) is preferred to the acquisition of benefits.' (Art. 30)
Damage, limits of relief:
'Injury (*ḍarar*) is removed as far as possible.' (Art. 31)
'Whether a want (*ḥājah*) be general, or whether it be special [that is, whether of a public or private nature], it is reduced to the degree of necessity (*ḍarūra*).' (Art. 32)
Constraint (*iḍṭirār*):
'Constraint does not destroy the right of another.' (Art. 33)
Effect of prohibition:
'When it is forbidden to take a thing, it is also forbidden to give it.' (Art. 34)
'When it is forbidden to perform an act, it is also forbidden to request its performance.' (Art. 35)

Custom:
'Custom is authoritative.' (Art. 36)
'Public usage is conclusive and action must be taken in accordance therewith.' (Art. 37)
'A thing which it is customary to regard as impossible is considered to be impossible in fact.' (Art. 38)
Change of Law:
'It is undeniable that rules of law vary with the change in times.' (Art. 39)
Custom:
'Effect is only given to custom where it is of regular occurrence or when universally prevailing.' (Art. 41)
'Effect is given to what is of common occurrence, not to what happens infrequently.' (Art. 42)
'A matter recognised by custom is regarded as if stipulated by agreement.' (Art. 43)
'A matter established by custom is like a matter established by a legal text.' (Art. 45)
Choice (*istiḥsān*) between exigence and prohibition:
'When prohibition and exigence conflict, preference is given to prohibition.' (Art. 46)
Damages:
'When the original fails it is resorted to its substitute.' (Art. 53)
Public interest (*istislāḥ*):
'Management of citizen's affairs is dependent upon public welfare.' (Art. 58)
Mistake of fact:
'No validity is attached to conjecture which is obviously tainted by error.' (Art. 72)
Liability accompanies benefit:
'The enjoyment of a thing is the compensating factor for any liability attaching thereto.' (Art. 85)
'Liability is an obligation accompanying gain. That is to say, a person who enjoys the benefits of a thing must submit to the disadvantage attaching thereto.' (Art. 87)
'The burden is in proportion to the benefit, and the benefit in proportion to the burden.' (Art. 88)
Freedom from liability to compensate:
'Permission by the canon law [*sharī'a*] excludes the liability to make compensation.' (Art. 91)
Liability of wrongdoers:
'Liability lies on the direct author of an act, even though acting unintentionally.' (Art. 92)
'The person who does an act on one thing which leads naturally to the destruction of another thing, as long as he does not act intentionally, does not become responsible.' (Art. 93)

Property rights:
'The dealing by one person with the property of another, without his leave, is not lawful.' (Art. 96)
'Without legal cause it is not allowed for anyone to take the property of another.' (Art. 97)

Implications of fundamental principles of *sharī'a*: the primary sources of *fiqh*

Chapter 2 points out that *qiyās* and *ijtihād* are almost synonymous terms. *Ijtihād* might be considered a generic term for individual opinion formed by using the various deductive and inductive methods of reasoning, subsumed in all the sources of *fiqh*, and all the *sharī'a* principles and maxims discussed here. The process of collective, legally enforceable, decision-making is *ijmā'*. In this sense there are only two primary sources of Islamic substantive law (*fiqh*): *ijtihād* and *ijmā'*. For the sake of clarity we shall follow in this and the following section the divisions of Islamic jurisprudence presented in Chapter 2.

Qiyās

We have pointed out the distinction, tension, complementarity, and hierarchy between deductive *qiyās*, with the *sharī'a* as its source and subject matter; and inductive *qiyās* whose sources and subject matter are the *āyāt* of God in the objective natural and social sciences. Inductive *qiyās* is inductive reason. We may now identify, in due proportion, the sources, methods and subject matter, of deductive *qiyās* with the *shar'iyya* sciences of Ibn Khaldun and al-Ghazali and the *sharī'a*-susceptive realm of environmental engineering systems planning; and inductive *qiyās* with the rational, 'natural,' 'philosophical,' non-*shar'iyya* sciences and the universal rational realm of environmental engineering systems planning.

In the context of a natural science like hydrology, the formal recognition and development of inductive *qiyās* not only makes it possible to have hydrologically feasible statutes; it also affords a chance to implement better the intent of the *sharī'a* ascertained through deductive *qiyās*. It has been shown that the *Sunnah* texts and the rulings of classical *fiqh* delineate the conditions under which *ḥarīm* could be established. Nevertheless, to promote the public interest and preserve the coequal and correlative rights of neighbours; claims of exclusive ownership and usufruct of water in a groundwater basin were denied to an individual who claimed it on the plea of prior appropriation or riparian situation. The interests of justice, which these efforts of the Prophet and later jurists sought to realise, can be best served by continued testing, review and understanding of hydrologic and other physical facts for each individual

watershed and groundwater basin. On the other hand, fixing the *ḥarīm* at forty cubits for water supply wells for all times, in all social and demographic situations, despite spatial and temporal variations in the hydraulic, hydrologic, pedologic, climatologic, and geomorphologic factors, brings a disharmony between the ends of justice aimed at by the *sharī'a* through deductive *qiyās* and the conclusions of inductive *qiyās* in natural science.[13] Therefore, when there is a change in the physical facts and the social and technological milieu on the basis of which a substantive law was legislated or juridically interpreted, that law or ruling must be modified to suit the new environment. Hence the *sharī'a* maxim: 'It is undeniable that rules of law vary with the change in times.' (*Majallah*, Art. 39). That is, according to the definition of *qiyās*, when the effective cause (*'illa*) changes, the *fiqh* rules derived by deductive *qiyās* undergo corresponding change and evolution. The effective cause could be any one of the innumerable social, technological, and institutional factors in the universal rational realm of environmental engineering systems planning. It must be noted that only the laws, rules, regulations, and judicial and administrative interpretations of substantive law are subject to change in this sense.

As far as the hierarchy of the sciences is concerned, the value-judgements of *sharī'a* and *fiqh* must be superimposed upon the objective facts and data of the rational, 'philosophical' sciences discerned through the exercise of inductive *qiyās* (Chapter 3). This is the basic impulse of the Islamic ethos. Hence the *sharī'a* maxim prescribing the hierarchy of values, subordinating pure utilitarianism to ethical judgements: 'The repelling of mischief (or evil) is preferred to the acquisition of benefits' (*Majallah*, Art. 30). That is, private or public benefits must be forgone, and national interests subdued, in order to perform what is *farḍ* and to desist from what is *ḥarām*. This is implied also by the 'five values' for social action presented by Ibn Hazm (Chapter 2), and the praiseworthy-blameworthy categories elaborated by al-Ghazali (Chapter 3). This principle subordinates purely economic, political or engineering judgements to the criteria of social justice in Islam.

On the basis of this principle Muslim jurists built the theory of abuse of rights governing the relations between neighbours. It provides that a person might be denied the exercise of a right if it causes excessive damage to others. Thus an activity or industry causing excessive environmental pollution, or other public damage, might be stopped or curtailed even though this may cause economic loss to the owners of the business. A wrong must be redressed for the sake of justice even though there may be economic benefits in the perpetuation of the wrong. For example, an illegally constructed house may be pulled down and the site cleared.[14] Similarly, given the tendency in Islamic doctrines towards economic equality, based on the Quranic principle that national wealth and income 'should not be taken by turns by the rich among you';[15] public projects cannot be justified on the basis of 'benefits to whomsoever they may

accrue'.[16] The Islamic state will be required to give up, as a matter of *sharī'a* environmental code, short-term pecuniary gains, pure economic efficiency, and technical or engineering advantages of a project, in order to realise the higher values such as income redistribution, inter-regional income transfer and equity effects, and protection of the environmental resources. The marginal utility of income, stemming from public projects, will not be equated for all beneficiaries at various income levels.

project financing. Principles of benefits sharing, and the incidence of costs and charges, among the users and beneficiaries of public projects call for separating direct and indirect costs and benefits of public projects on the basis of whether they accrue to private or public interests, rather than allocating them to project functional purposes. A thorough discussion of these issues must await exposition of *sharī'a* economic maxims. It is sufficient to state that the *sharī'a* maxims given above (*Majallah*, Arts 85, 87, 88), are pertinent to these issues. These principles could be considered analogical deductions of such Quranic verses: 'Wrong not and you shall not be wronged';[17] 'And no bearer of burden can bear the burden of another';[18] 'Man shall have nothing but what he strives for';[19] 'For men the benefit of what they earn; and for women the benefit of what they earn.'[20]

In summary, deductive *qiyās*, or *ijtihād*, relies primarily on the *sharī'a* sources to determine the *sharī'a* and *fiqh* rules pertinent to the value-oriented or *sharī'a*-susceptive realm of environmental engineering systems planning. Inductive *qiyās*, or *ijtihād*, relies on the *āyāt* of God in nature and history – that is, the natural and social sciences – to determine all the universal rational sciences pertinent to environmental engineering systems planning. The realisation of the *sharī'a* goals depends on the development and implementation of the best possible laws consistent with the knowledge of the universal rational sciences, and the superposition of *sharī'a* goals and values on the institutions and spheres of action of these sciences.

Ijmā'

Decision-making must be through *ijmā'* (Chapter 2). It must operate in the *sharī'a*-susceptive and universal rational realms of environmental engineering systems planning at the various levels of *shūrā*. Such decision-making takes place in the community, among the competent in all individually requisite and specialised sciences, and through the political representatives of the community in the proper institutions. *Ijmā'* operates in the legislative, administrative, and judicial processes of government. Its final authority is the Muslim community (*ummah*) without whose consent *ijmā'* is neither valid nor complete. *Ijmā'* is the most important principle of Islamic law, state, and government. Its implications for decision-making in environmental engineering systems planning are treated in Chapter 5.

Implications of fundamental principles of *sharī'a*: the secondary sources of *fiqh*

The *sharī'a* maxims of the *Majallah* portend the sources of *fiqh*. These principles are important in giving substantive content to the *sharī'a*-based code for environmental engineering systems planning, as guidelines for positive legislation and the more detailed administrative enforcement and judicial interpretation.

Istiṣlāḥ *or* al-Maṣlaḥa

According to Ibn Khaldun the subject matter of the universal rational sciences is outside the purview of *sharī'a*. However, as Ibn Rushd emphasised, 'philosophical' sciences are explicitly enjoined by the Quran. The 'philosophical' sciences 'comprise every science which is indispensable for the welfare of this world'; without them, al-Ghazali maintained, 'a community would be reduced to narrow straits'. Thus man's welfare is the reason and justification for pursuit of both the universal rational and the *shar'iyya* sciences. It was the same concern for human welfare, or public interest, that prompted the critique of some of the doctrines and sciences of the 'philosophical' and *shar'iyya* sciences (Chapter 3).

Public interest is achieved by implementing Islam. This means implementing the principles of *sharī'a* for imitative-innovative rejuvenation of Islamic scientific-technological and ideological cultures (Chapter 2); enforcing the criteria for educational planning and research applied to environmental engineering systems planning; organising course structure and content in conformity with the Islamic environmental engineering education system (Chapter 3), and identifying and applying the *sharī'a* legal maxims discussed in this chapter.

In Chapter 5 we shall bring out two unique features of the Islamic concept of 'public interest'. First, Islamic law, culture, and state aim at human welfare in this as well as the world to come. Public interest must be consistent with the objective, permanent values of truth and justice in Islam. Second, the reason for being of the ideal Islamic state is 'universal common good' (*maṣāliḥ al-kāffa*) rather than the narrower and sectarian goal of 'public interest' (*maṣāliḥ al-'āmma*); removing this invidious distinction, we will use the two terms as synonymous. The ethos of Islamic political system is rule of law: *sharī'a* and *fiqh*. This constitutes public interest. The various engineering and technological codes, specifications, standards, and guidelines are another aspect of rule of law as opposed to irrationality and arbitrariness.

'Management of citizen's affairs is dependent upon public welfare' (*Majallah*, Art. 58). The principle of hierarchy of values (*Majallah*, Arts 27–29) resolves conflicts of values and interests by accepting and doing the smaller wrong and the lighter damage in order to avoid the greater wrong and the severer damage. Hence it is permissible for the state to

interfere in the private lives of individuals if that will contribute to the public good. 'A private injury (*ḍarar*) is tolerated in order to ward off a public injury' (*Majallah*, Art. 26). The following are some of the actions which the Islamic state may take based on this concept of public interest according to traditional *fiqh*: restraining or prohibiting unqualified men from practising a profession like engineering; expropriation of private property after payment of compensation if needed for public projects; pulling down a burning house in order to control the fire, without the permission of the owner and without an obligation to compensate him for the loss; price control; and the forcible breaking up monopolies.[21]

The government is required to promulgate many regulations for administrative purposes in order to implement *sharī'a* and *fiqh* statutory laws and judicial interpretations. These comprise administrative law, or *al-aḥkām al-sulṭāniyya*.[22] These administrative details are *mursal*, outside the purview of *sharī'a*. All such matters must be decided by *ijmā'*, with a view to furthering the common good. This can be accomplished by decision-making criteria such as those of *istiḥsān*.

Istiḥsān

Traditional *fiqh* utilised the principle of *istiḥsān* (Chapter 2) as an equivalent of public interest and equity; to set aside the conclusions arrived at by literal or speculative analogical deduction in favour of alternate solutions arrived at on the basis of different *sharī'a* principles, such as custom and public interest. That is, as the device to establish a hierarchy of *sharī'a* values among the ideally-existent values or terminal goals, and the real values or instrumental goals. The problem most often involved, at least implicitly, choosing the best among alternate juridical interpretations and socio-political expedients, and the values and objectives subsumed by them, with a more or less clear anticipation of the consequences of the decisions. There is a conceptual congruity of *istiḥsān* with the concepts and philosophy of optimal decision-making, and optimisation through operations research and systems analysis applied to the politico-economic planning of engineering projects.[23]

The identification and screening of alternatives, with possible alternate and mutually exclusive objectives, is the heart of the process of engineering systems planning. There may be technological and engineering alternatives; alternate political institutions or organisations for planning and development of resources; options of size, timing, and location of projects.[24] It is crucial for proper decision-making to distinguish between alternate objectives, serving as intermediate or terminal goals; and associated technical or engineering design alternatives serving as mere instrumentalities. This enlarges the engineering systems planner's horizon to include intra-industry and inter-industry alternatives. Following our bifurcation of the disciplines comprising environmental engineering systems planning into *sharī'a*-susceptive and universal rational realms, the alternatives might be value-free or value-constrained.

An instrumental goal might be the selection of a form of organisation for the planning, design, construction, and operation of a river valley project.[25] We are given objective facts and information regarding the form of governmental organisation in a country; the country's standards of living and education, particularly its stock of engineering and administrative resources; and the size and topography of the river basin. The best form of organisation here might be a government department or agency; a semi-autonomous corporation or river valley authority with statutory powers; or a non-statutory, inter-ministerial, inter-state control board. The most suitable alternate form of organisation will be chosen in terms of the given technical objective and the physical and sociological data, to accomplish, under the *sharī'a* command of *istiḥsān*, the terminal goal of people's welfare. For example, in the case of a simple objective of the structural design of a dam at a site, the most suitable and feasible design will be selected from among several possible types of dams – overflow and non-overflow dams; earthfill or rockfill dams; concrete arch, gravity, or buttress dams.

Complex optimal designs of water resource systems[26] can be developed and evaluated subject to technological, economic, and socio-political constraints. Here the objectives, design criteria, and constraints will be defined and hierarchised within the ideological context of Islam when they fall within the purview of the *sharī'a*-susceptive realm of environmental engineering systems planning. But the methodology of system design, based on methods and techniques of engineering and economic analyses, and the procedures for identification of optimal designs, will be within the universal rational realm. These methods must meet the criteria of *istiḥsān* technically and sociologically rather than ideologically. For example, if simple, single-purpose, medium scale development projects are called for due to the financial and technical manpower constraints of a country, then the methods and techniques of analysis of multi-purpose, multi-unit systems would be irrelevant.

'Urf: *Muslim customary law, or traditional* fiqh

Al-ma'rūf,[27] the generic term used in the Quran, connotes literally all that which is 'good', enjoys 'popular social acceptance', and contributes to mutual 'friendliness', 'kindness', and 'beneficence'. It covers laws, ideas and institutions as well as usages, customs and conventions which are enjoined in the Quran in a general exhortative manner and sometimes specifically prescribed as *sharī'a* laws.

Zayn al-'Abidin ibn Nujaym (d. AH 970/AD 1563), defined custom as 'those recurring practices which are acceptable to people of sound nature'.[28] These traditional practices acquire a legally superior authority as statutory law when they are based on *ijmā'* legislation. Inasmuch as customs are an evidence of consensus by practice (*ijmā' al-fi'al*), and implicit social acceptance (*ijmā' al-sukūt*, 'silent assent'), they are

superior to an individual analogical deduction or personal expert opinion. It was noted in the review of medieval Islamic law (Chapter 2) that the classical legal schools evolved slowly over long periods of time. Their laws were not drafted and codified by formal committees of competent scholars and legislated by an assembly of representatives. In this sense, therefore, the entire corpus of traditional Islamic substantive law, scattered in the writings of scholars accepted as authoritative; is customary law rather than statutory law, except that Muslim rulers promulgated by decrees what was prescribed by trustworthy scholars and acceptable to the people. Legislation relevant to environmental engineering systems planning is an even more recent phenomenon.

We discussed (Chapter 2) customs and traditions, and their legal implications, in a broad perspective as various fundamental legal principles of *sharī'a*: *Sunnah* or *Ḥadīth* (traditions or sayings of the Prophet Muhammad); pre-Quranic revelations; *'urf*, *'ādah*, *t'āmul*; and foreign sources of *fiqh*. Here we shall discuss more specifically Muslim customary law relating to water, and its changing status in independent Muslim countries since legislative assemblies have resumed the task of enacting statutory laws.

Some of the possible *sharī'a* maxims sanctioning customs and usages are: 'Custom is authoritative' (*Majallah*, Art. 36); 'What is from time immemorial will be kept in its ancient state' (*Majallah*, Art. 6). These and other similar maxims must be read in conjunction with those limiting the scope of customary law.[29] The latter prescribe that what is contrary to the *sharī'a*, and injurious to private or public interests, cannot be valid customary law. Customary laws are subject to amendment and abrogation since Islamic substantive laws (*fiqh*) evolve and 'vary with the change in times' (*Majallah*, Art. 39). The conclusions drawn here and in Chapter 2 regarding the scope and revocability of the Prophet's 'legal, binding *Sunnah*' concerning water law apply with even greater force in relation to Muslim customary laws.

A review of water laws in Muslim countries as they existed during the early 1950s shows that in most cases Islamic customary and codified laws existed side by side with, or were replaced by, laws decreed by Western colonial administrations. In most Muslim countries which had been independent for some time, Islamic customary and statutory laws remained in effect.[30] Of the three Muslim countries in Asia and the Far East for which we have more recent information, Islamic customary law is widespread in Afghanistan and Iran. These countries had not been under direct alien rule. This may be contrasted with Brunei which, due to its British colonial history, used the common law of England in addition to customary and written laws of Islamic inspiration.[31]

Recent trends in Muslim countries show the review and incorporation of these Islamic customary laws by statutory legislation and, more recently, the legislation of a basic water code in Iran. The 'Iran Water

Law and the Manner of Water Nationalisation' was enacted in July 1968. We believe this code meets *sharī'a* principles with regard to: national ownership of all water resources; prohibition on sale of water by private parties; concern for public interest in all matters such as water right, water uses, prevention of pollution, fixing water charges; mutual aid in compensating loss incurred due to high cost of acquiring water in a river basin through incomes in another basin where costs are lower; sharing water project development and maintenance costs among beneficiaries and gradualism and leniency in enforcing the code. Collection of 'interest' with water charges may be justified in this case since the industry is nationalised and all revenues are to be used for public benefit; and the code has provisions for mutual aid and income redistribution through subsidy to water users who have suffered a loss as a result of this legislation.[32]

Foreign sources (non-Muslim)

The *sharī'a* explicitly enjoins Muslims and provides principles to borrow, adapt, and assimilate all that is good in non-Muslim cultures, and to reject those borrowings which are repugnant to the *sharī'a* (Chapter 2). Conforming with these principles are Ibn Khaldun's discussion of the sources, scope, and universality of the 'philosophical' sciences; al-Ghazali's arguments for assimilating the praiseworthy sciences even if they are found 'only in the [erroneous] 'philosophers' books'; the imitative-innovative assimilation of the *sharī'a*-susceptive as well as universal rational realms of environmental engineering systems planning; and translations as a mechanism of transmission to Muslims the science, technology and humanistic-social sciences developed by non-Muslims (Chapter 3). We will present in Chapter 7 the rise of post-Quranic Islamic and Catholic-Protestant medieval civilisations as examples of socio-cultural rejuvenation and development through cross-cultural diffusion, its universal patterns, and a blueprint for contemporary Islamic socio-cultural rejuvenation by imitative-innovative processes.

Borrowings from foreign (non-Muslim) sources can be assimilated more readily in Islamic culture when they fall in the scientific-technological realm of environmental engineering systems planning. Regardless of the ideological background or personal character of the authors, the best known methods and techniques of analysis for optimal design of water resource systems, for design of dams, and the most suitable systems of organisation for planning and development of environmental resources must be adopted.[33] This argument is congruent with our discussion of *istiḥsān* above.

The objectives, value-judgements, and ideological criteria of Islam must be adopted in the *sharī'a*-susceptive realm of environmental engineering systems planning. However, even in this *sharī'a*-susceptive realm, Muslims need not always precede the non-Muslims in perception of a truth, nor is this the exclusive province of those who are Muslims by

birth. According to the Quran, one can perceive the existence and oneness of God, without the aid of scriptural revelation, by pondering the 'signs of God' in nature like the Prophet Abraham.[34] This was the theme of one of the most remarkable medieval books, repeatedly translated into Western languages, *Hayy Ibn Yaqzān* (*The Living One, Son of the Vigilant*), by Abu Bakr ibn Tufail (in Latin, Abubacer or Abentofal, d. AH 580/AD 1184). This mystico-philosophical romance showed that a man, abandoned on a desolate island at birth and nourished by a mother roe, attained first the knowledge of natural phenomena and then of God through his self-developed inductive intellect. When later apprised of the concepts of the Quran and the method of the Prophet Muhammad, he recognised them as true.[35] Therefore, non-Muslims can discover rationally knowable moral and ethical truths which Muslims can assimilate from them, or the two groups can discover them independently. Primordial Islam and later the Quran declared God as the owner of all resources of the universe. From this developed the *sharī'a* concept of *ḥuqūq Allāh*, or collective rights and rights of the community. As an application, the principle of communal ownership of water resources was defined and administered by the Prophet Muhammad. This principle now finds growing acceptance among the nations of the world. 'In many modern countries, water legislation considers water resources as belonging to the state, or to the public domain, signifying the whole community.'[36]

Ṭaysīr *under* iḍṭirār *or* ḍarūra

In times of hardship and constraint, violation of explicit *sharī'a* ordinances is permitted, subject to certain conditions. The relevant *sharī'a* maxims are: 'Hardship begets facility'; 'Latitude should be afforded in the case of difficulty. That is to say, upon the appearance of hardship in any particular matter, latitude and indulgence must be shown'; 'Necessity renders prohibited things permissible' (*Majallah*, Arts 17, 18, 21). However, permissibility of things prohibited is subject to limitations. First, by the extent of the stress and necessity, for permissibility does not imply licence, or facility to the extent of luxury (*Majallah*, Arts 22, 31, 32). Second, the *sharī'a* law held in suspension is applied in full as soon as the exceptional circumstances are mitigated or removed (*Majallah*, Arts 23, 24). Third, constraint does not necessarily abolish another person's rights, or the liability for compensation (*Majallah*, Art. 33).

The Quran explicitly prohibits the receiving or giving of interest although trade and business partnerships are encouraged. Loans given by the rich to the poor should be converted to outright grants, or the creditors should at least postpone repayment of interest-free loans until the poor debtors are able to repay: 'And if (the debtor) is in straitness, let there be postponement till (he is in) ease. And that you remit (it) as alms is better for you, if you only knew.'[37] This is one example of leniency and the means to mitigate hardships.

The report, *Partners in Development*, prepared for the International Bank for Reconstruction and Development, indicates that the poor countries are getting poorer. Besides other causes, this is due to the mounting burdens of foreign indebtedness. There has been a steady decline in grants as a proportion of total net flow of financial resources from the developed to the underdeveloped countries. The cost of money lent to the poor countries is increasing, the interest rate charged by the World Bank itself rose from 4.25 per cent in the late 1940s to 7 per cent in 1969. The terms of concessional development finance recommended by the report call for a seven to ten years grace period, twenty-five to forty years maturity period, and an interest rate no greater than 2 per cent.[38]

However, the poor countries have no power to force creditor countries to comply with these recommendations, let alone the Quranic terms which imply 100 per cent grants coupled with engineering-economic technical supervision of the development projects by the donor countries. Therefore, under the existing constraints, it would be permissible for Muslim industrialists, entrepreneurs, development agencies, and governments, to accept necessary development loans from lending countries and institutions with interest on the best available terms. However, the *sharī'a* demands from them parallel efforts to eliminate the need for loans with interest by gradually developing and improving other elements in the strategy for self-sustained growth. These include all possible and unequivocally *sharī'a* permissible efforts such as internal financing; curtailing non-essential imports; regional co-operation for development among underdeveloped countries, Muslim as well as non-Muslim. Regional co-operation could be in trade and commerce, engineering-economic planning as well as political by playing down political nationalism and economic autarchy and, perhaps most important of all, cutting down defence outlays.

Tadrīj

In the reconstruction of Islamic thought and institutions, and specifically in bringing into conformity with *sharī'a* and *fiqh* the value-oriented and ideological aspects of environmental engineering systems planning, the protagonists of Islam must constantly keep in mind another *sharī'a* principle, gradualism, which is akin to leniency. *Tadrīj* must be reckoned one of the most basic principles of the Quranic methodology for social change. It is applicable in scientific-technological imitative-innovative assimilation as well as in matters of socio-legal reform such as in bringing about the transition in Islamic law from traditional and customary law to statutory law enacted in a modern *sharī'a* state (Chapter 5).

The Quranic legislation dealing with prohibition of intoxicants is a classical example of gradualism and leniency in the Islamic strategy for comprehensive social change. It proceeded in at least five stages. During the Prophet Muhammad's first thirteen years of Prophethood while he

was in Mecca, there was no direct mention of intoxicants. Attention was focused first on the more fundamental issues of basic beliefs, motivation, education and general moral discipline. In the second stage, intoxicants were first spoken of in the Quran in deprecatory terms. Thirdly, when the Prophet migrated from Mecca and established the Islamic city-state of Medina, a recommendatory Quranic verse made an invidious comparison between the disadvantages and advantages of intoxicants. This completed the processes of education and exhortation. In the penultimate stage, restrictions on consumption of alcohol were imposed, forbidding Muslims from being in a state of drunkenness at the time of their five daily prayers. Finally, a verse of the Quran was revealed which prohibited intoxicants unequivocally. Muslims readily complied with the law, emptied their stores and wine flowed in the streets of Medina.[39] It is significant to note that God did not even reveal a deprecatory verse against intoxicants for about half the period of the Prophet Muhammad's ministry, even though this evil could have been at least partly curtailed in Mecca through voluntary abstention by Muslims in the absence of the enforcement powers of the city-state of Medina.

This strategy of gradualism in social reform and regeneration – based on sequential processes of motivation, education, exhortation, legislation, and lastly the application of sanctions – is important in the Islamisation of engineering-economic planning. This shows that many un-Islamic and non-Islamic features in contemporary engineering education, professional practice, law and administration will have to be tolerated in Muslim countries until they can be gradually revoked and Islamised. Gradualism also becomes the guiding principle in seeking compliance with engineering standards and specifications, professional ethical standards, and in all other matters in the conduct of engineering management.[40]

The principle and processes of gradualism are indispensable in view of the supreme importance attached in the Islamic value-system on preserving and promoting man's moral freedom of choice (Chapter 1). Such gradualism places primary reliance on Islamic motivation, education and exhortation prior to the actual institution of change, and secondary reliance on external forms of coercion only for the administrative and judicial enforcement of self-approved laws. This social change, however radical, is autogenous and orthodox, with rapport between those who institute change and those who are being changed. On the other hand, instant revolutions must rely on coercion and authoritarian methods as the primary agents of change.

The Islamic methodology of gradualism is also economical and efficient since it relies on the inner-directed man for enforcement of law. Thus it is said that customary water law has been more or less self-enforcing 'even during the most anarchistic periods' in the arid zones of Muslim countries. The *sharī'a*-inspired 'sense of mutual respect for each other's rights is so strong that there are seldom disputes' in sharing water from irrigation canals in Saudi Arabia.[41]

Transition from Islamic customary (traditional) law to modern *ijmā'* legislation

The resumption of legislative activities in the old and newly independent Muslim countries, and the consequent review of traditional *fiqh*, calls for a few remarks on the prospects for Islamic law during its transition from customary to modern statutory legislation, and the *modus operandi* of this transition.

During the life-time of the Prophet Muhammad and the Four Rightly Guided Caliphs, Islamic law was not developed systematically. Thereafter Islamic law developed first as professorial law. In the absence of formal legislative assemblies under the absolute kings of the Umayyad and Abbasid dynasties, Islamic law became customary as it crystallised and gained tacit social acceptance, or was decreed by the pseudo-Caliphs and Sultans. Later on Islamic law became judge-made and interpretative; almost slavishly imitative within the corpus of the five major classical legal schools.[42] With the decline and elimination of political absolutism and authoritarianism, together with the development of *farḍ 'ayn* Islamic knowledge and the *shar'iyya* sciences, statutory *ijmā'*-legislation based on *ijtihād* must be the *modus operandi* of Islamic law in our times.[43]

In this study we have invoked the ideal Islamic right to exercise *ijtihād* up to its ultimate limit: reunderstanding the *sharī'a* from its sources and their methods of inductive and deductive reasoning. This should not reduce the value of traditional codifications of the *sharī'a* such as the maxims of the *Majallah* since the permanent values or 'primary system of meanings' of a socio-cultural system vary little with time and place (Chapter 7). We have not discussed the detailed laws of the *Majallah* pertinent to environmental engineering systems planning since they belong more to the ephemeral, amendable and revocable, *fiqh* category.

The general principles of water law or environmental engineering systems planning in general which could be established through a 'comprehensive study' of the historical consensus of Muslim individual expert opinions and customary laws[44] cannot become Islamic fundamental law or even a legal precedent. Acceptance of the authority of precedent and past consensus as basic law, is of necessity, the first postulate of traditionalism. This is incompatible with explicit Quranic texts (Chapter 1), and the concepts and institutions subsumed by *ijtihād* and *ijmā'*. The contemporary consensus of a properly constituted Islamic legislative assembly is not bound by a precedent and past consensus. Similarly laws enacted and ideological formulations made on the sole authority of popular consent and social convention through exercise of pure reason do not become Islamic by the mere fact of their authors being Muslims in the sociological sense. This would violate the most fundamental principle of Islam according to which the primary source of *sharī'a* is the will of God, made known through scriptural revelation and prophethood, and not the

'sovereign' will of the people. Actual conformity with the *sharī'a*, and intention (*niyya*)[45] of the legislators and decision makers, would decide whether or not a law, an idea, or an action is Islamic or secularist. The prospects for Islamic law, and Islamic ideological culture in general, would depend ultimately on their indoctrination and dissemination through education, research, publication and propagation through private and public efforts.

5 Islamic state and comparative politics: implications for environmental engineering systems planning

Introduction

The aim of Islam is social justice 'by establishing what is right and forbidding what is wrong'.[1] But whoso wills the end must will the means. As Ibn Taimiyya (d. AH 728/AD 1328) pointed out: 'To govern the affairs of men is one of the most important requirements of [the] religion [that is Islam], nay, without it religion cannot endure. . . . The duty of commanding the good and forbidding the evil cannot be completely discharged without power and authority.'[2] Without the Islamic state, it is not possible to realise the ideals of Islamic socio-political and economic justice; implement Islamic law; establish the Islamic system of education; and defend Islamic civilisation against domestic perversions and foreign aggression. Society would be helpless against 'stubborn tyrants' (*jabbār al-'anīd*),[3] and Islam abridged to mere worship and platitudes. Islam's promise as the guide for man's happiness in this world and the hereafter would not be true. The Islamic state is, therefore, 'an effort to realise the spiritual in human organisation'.[4]

This chapter delineates the *sharī'a* fundamental constitutional principles concerning the goals, structure and organisation of an ideal Islamic state. The characteristics of ideal Islamic political culture are described after Ibn Khaldun. The Western typology of contemporary Muslim states is brought within the purview of the ideal formulations of Islamic state and political culture. These formulations are compared with the concepts of Western 'political' and Marxist-Leninist 'social' democracy concerning the principal controversies on method and content of decision-making. The aim is to bring out the principles of Islamic political thought, and the possibilities of assimilation of those concepts and institutions of contemporary non-Muslim developed and mobilised systems which are compatible with the fundamental principles of Islamic political philosophy. This is the fundamental problem in rejuvenation and modernisation of Islamic political thought since the partial success of its impulse in modern times which found 'its most dynamic expression in the efforts to free Muslim peoples from alien domination'.[5] Specific concepts of decision-making methods, conditions and criteria; goals and institutions; processes of political activity and concepts of planning and public interest, are

subsumed by the type of state and political culture. Since the framework and content of environmental engineering systems political decisions are determined by this typology, the implications of Islamic political philosophy for these factors are discussed.

To preclude invidious comparisons between the higher aspirations of one type of democracy and the meagre achievements of another, the 'ideal types' of democracy, unless otherwise specified, are dealt with from the 'cultural relativist'[6] perspectives. According to general agreement among non-Islamic experts in a UNESCO symposium on the meaning of 'democracy,' the Islamic state is also a special type of democracy. The terms Islamic state, *sharī'a* regime, and Islamic democracy are used as synonyms.

Principles of the Islamic (*sharī'a*) state[8]

The basic principles enumerated here are based on explicit *sharī'a* texts; the subsidiary principles are derivative, belonging to the *fiqh* realm of Islamic law. The basic principles must be part of every Islamic constitution. The summary is limited to the basic principles most relevant to our purpose.

Sovereignty[9]

1 Absolute, real, or legal sovereignty belongs to God. It is reposed in the will of God as understood from the *sharī'a*. The *sharī'a*, politically, is the ideal constitution of the ideal Islamic state.[10]
2 The Muslim community – represented by the consensus of the people (*ijmā' al-ummah*) – accepts the position of God's vicegerent (*khalīfa*) on earth. In this derivative sense it enjoys the attributes of sovereignty and self-determination. The vicegerency of the Muslim community entrusts them the responsibility to identify the *sharī'a* from its sources and implement it empirically.
3 The *sharī'a*, as the repository of actual sovereignty and the ideal constitution, is inviolable.[11] The Islamic substantive law (*fiqh*) – comprising the legislation, administrative rules and judical interpretations – should not contravene the *sharī'a* constitution and statutory codes.

Shūrā *and* Ijmā'[12]

1 Decision-making in all communal affairs shall be mutual consultation and consensus.
2 The leadership and government of the state must be established on the basis of consent of the people through election. A government or authority (*sulṭān*) established by any non-*sharī'a* means has no legitimacy and cannot demand loyalty from the people. Thus the non-elective means of assuming power such as a coup d'état (*imarat al-istīlā'*, 'government by seizure'),[13] and hereditary kingship (*mulk*) are illegal.

3 There shall be a 'consultative assembly' (*majlis al-shūrā*) representing the community through free and fair elections. The elected head of state (*imām*, caliph, president), legislators or assemblymen (*ahl al-shūrā*), and the public decision-makers (*ahl al-ḥall wa al-'aqd*, literally 'the people who unravel (problems) and conclude') shall have requisite Islamic qualifications in terms of knowledge, competence, trustworthiness, and social and personal ethics.

Rights of citizens, Muslim and non-Muslim[14]

All citizens are guaranteed certain fundamental rights. These include security of person, property, and honour; freedom of opinion and association; freedom of conscience, including the freedom to apostatise after accepting Islam;[15] the right to offer advice and criticism; equal treatment under law without discrimination; protection against one's religion, ideology, or person being reviled;[16] right of privacy, including freedom from surveillance by secret services;[17] freedom from unlawful detention; right to be provided with economic security, productive and remunerative work, free and compulsory education, free medical and health services; and the free provision by the state of the necessities of life to the disabled and deprived on account of illness, old age, and childhood, and to widows and unemployed.

Rights of the Islamic state[18]

All citizens, including the minority who voted against the government, are duty-bound to submit to the authority of the state, that is, the laws of the land. The *sharī'a* government has the right to impose economic obligations (*zakāt*), restrictions on private ownership and other individual rights, and conduct other rightful activities for the welfare of the community and the security of the state.

Allegiance is withdrawn from a government which sets itself openly and deliberately against the *sharī'a* and issues laws and regulations against its explicit ordinances. However, a minority should not rise in rebellion against a *sharī'a*-abiding government.

Special rights and limitations of non-Muslim citizens

Non-Muslim and Muslim citizens are entitled to the same civil rights. Since the Islamic state is an ideological state, decision makers who are in key positions of leadership and authority (*ūlū al-amr*) must be Muslims qualified to uphold the *sharī'a*. If the Islamic state had the presidential form of government, the secretaries or ministers could be non-Muslim if their authority is limited to being administrative assistants to the Muslim president. Non-Muslim citizens eligible for conscription in the military can claim exemption from service in lieu of the 'compensation tax' (*jizya*).[19]

Non-Muslims shall have socio-cultural autonomy, and the maximum

possible opportunities for self-governance in civil affairs dealing with juridico-political, educational, economic, religious, and other matters.[20]

(Ikhtilāf), *and the decisive consensus*

The positive role of dissent was elaborated by the Prophet Muhammad: 'The differences of opinion among the learned within my community are [a sign of] God's grace.' Differences of opinion shall be resolved on the basis of majority decisions which shall be binding on the entire community, including the dissenting minority. Whether the binding *ijmā'* should constitute a simple or an overwhelming majority would depend upon the importance of the questions involved. The principle of decision making through a simple majority among peers was defined by the Prophet Muhammad when he told the first two Rightly Guided Caliphs, Abu Bakr and Umar: 'If you two agree on a counsel, I shall not dissent from you.'[21]

Subsidiary principles on division of governmental functions: relation between legislature and executive[22]

The details of government structure and organisation are matters of *fiqh* subject to ephemeral sociological and technological factors. The following observations are based on the judgement that the Islamic state would be patterned on a presidential form of government.

Interdependence of legislative and executive functions. The Quranic dictum of *shūrā* implies that the office of presidency must integrate the legislative and executive functions of government instead of allowing their separation into two disjointed, mutually feuding powers. However, the decisions of the legislature must be binding on the executive.

Executive powers. The translation of legislative decisions into administrative policies and programmes is the responsibility of the president. The legislature should supervise the activities of the executive in a general way and oversee compliance with its legislative and policy decisions.

The president would be vested with all executive powers and functions. He would be responsible to the people through the legislative assembly for the policies and programmes of his government. He would delegate powers and functions to administrative assistants (*wazīrs*, ministers or secretaries); appointed by and held responsible to him.

The head of state will be responsible for policy-making through advice and consent of the legislative assembly.

Integration of legislative and executive functions. The principle of mutual consultation should operate between the legislature and executive in the research, drafting and initiation of legislation. This could be accomplished by assigning parliamentary committees to each minister to participate in all the processes of law-drafting.

Judical arbitration between legislature and executive. Since no *ijmā'* legislation or administrative ruling can contravene the *sharī'a*, there

should be a tribunal of Islamic jurists to act as the guardian of the *sharī'a*. These jurists could be proposed by the chief executive and approved by the legislature. The tribunal would arbitrate disagreements between the legislature and executive regarding the *sharī'a* value or constitutionality of matters referred to it. The tribunal could also veto on its own initiative any legislation or administrative decision if, in its judgement, it contravenes the *sharī'a*.

A model Islamic state: the Rightly Guided Caliphate (AH 11–41/AD 632–661)

The above principles of Islamic government were applied during the administration of the first four successors of the Prophet Muhammad, appropriately called the Rightly Guided Caliphs. For example, Caliph Umar (AH 13–23/AD 634–644) inaugurated a universal social insurance scheme on the basis of a regular population census taken by a specially created government department.[23]

Islamic scholars have kept alive the idealised memories of this model *sharī'a* state among Muslim peoples of every age and place. The characteristics of this model Caliphate which every movement to establish an Islamic state seeks to revive are: an elected, republican, constitutional government based on the rule of law (political democracy and *sharī'a* nomocracy); social and economic democracy; and the altruistic, *sharī'a*-abiding personality of the ruling elites (ethical democracy).

Typology of states and political cultures

Ibn Khaldun's typology of states and political cultures is presented to bring out the salient features of their goals, the sources and ends of their authority and the ideas and institutions they prescribe. The ideal Islamic or *sharī'a* state, called the Islamic democracy, is compared with the basic concepts of the ideal types of Western and Marxist-Leninist democracy. Contemporary Muslim states are described, according to Western global classification of the Third World developing nations, to evaluate their legitimacy and effectiveness in serving the processes and ends of decision making; the standards of comparison are the concepts of the ideal Islamic state. This sets the stage for discussion in the following sections of the implications of Islamic democracy for the methods and contents of decision making in environmental engineering systems planning.

Review of Islamic political thought

Medieval Islamic political thinkers have been divided into three main groups. The first two groups, the jurists and political philosophers, were primarily concerned with Islamic constitutional law. The third group, the political moralists and practical men in public service, strove to bring *de facto* unconstitutional regimes as much in conformity with Islamic ethico-

legal teachings as circumstances would permit. However, all political thinkers openly or tacitly agreed on the distinction between the *sharī'a* regime based on the rule of revealed law and the rational regime based solely on reason and experience. They looked upon the *sharī'a* state as the ideal polity whose constitution is the *sharī'a*. They believed in the superiority of the *sharī'a* state in comparison with the best rational regime. Such were the views of the greatest medieval Islamic political thinkers.[24]

Modern Islamic political movements have followed the first two groups of *sharī'a* constitutionalists and democrats. Political realists have followed their medieval counterparts in the face of alien domination of Muslim countries, and trenchant 'traditional authoritarian' and 'radical totalitarian' Muslim governments.[25]

Ibn Khaldun's Islamic typology of states and political cultures

Ibn Khaldun's typology is a continuation of the orthodox thinking of Islamic jurists and political philosophers.[26] However, he made it a part of his political sociology and Islamic philosophy of history.[27] The normative Islamic character and modernity of this traditional Muslim thought are the focus of our interest.

Ibn Khaldun distinguished between three principal types of state and political culture. He did not consider 'mixed regimes' an independent type despite its empirical and historical importance. We will correlate Ibn Khaldun's typology with contemporary Muslim and non-Muslim ideal types of states and political cultures, and later discuss their implications for environmental engineering systems planning.

Arbitrary rule, or 'natural' kingship (mulk ṭabī'ī).[28] This type of rule is established solely on the basis of *'aṣabiyya*[29] in its worst manifestations. It is based on 'superiority and force, which express the wrathfulness and animality (of human nature)'.[30] This is despotism which gives rein to the lower impulses of the rulers whose will is the only law. It does not operate on any principle of justice. As a consequence the *mulk ṭabī'ī* is characterised by constant confusion, bloodshed and instability until a superior form of government based on the rule of law arises.

Rational regimes (siyāsāt 'aqliyya). Political regimes based on the rule of law are of two major types: rational regimes devised by natural reason alone, and the regime of divine law based on scriptural revelation as well as reason.[31]

Rational regimes are established through natural solidarity modified by rational precepts instrumental in attaining worldly aims. Their 'political norms which are accepted by the mass and to whose laws it submits' are 'ordained by the intelligent and leading personalities and minds of the dynasty'. These ruling elites 'cause the masses to act as required by intellectual insight into the means of furthering their worldly interests and avoiding anything that is harmful'.[32] The ruler and the ruled are united by

an *external* bond based on coercion, rewards, and punishments. Their ultimate objective is pursuit of justice, a life of moderation, and promotion of the common good. The end of these virtues is to prevent pain, sickness and premature death, and to ensure the longest and greatest possible enjoyment of physical pleasures for members of the community in an advanced form of social life called 'civilised culture' (*'umrān*). The limited nature and end of rational regimes confine their norms and virtues to external and apparent goods of this life, and the wellbeing of man's body. Rational 'political laws consider only worldly interests. "They know the outward life of this world".'[33]

There are two main types of rational regimes:

1 *The rational regime whose primary end is this-worldly public interest* (maṣāliḥ 'āmma, istiṣlāḥ).[34] 'The first type of politics may concern itself with the (public) interest in general, and with the ruler's interest in connection with the administration of his realm, in particular.'[35] The principle of justice upon which it rests is that the ruler should promote the interest of the ruled instead of his own. The character and qualifications of the ruler, and the offices and institutions of the state are determined to meet these ends. This regime is just when it meets all requirements of rational political philosophy. This, however, is a qualified justice. The limited nature of the end such a regime pursues does not satisfy all the true ends of man. Even the qualified justice of this regime is not assured since, 'lacking the divine light',[36] it can neither insure correct decisions regarding man's true ends in this world nor put limits on the powers of the rulers. Such rulers tend to give primacy to their own interests, are mostly unjust, and eventually become tyrants.
2 *The rational regime whose primary end is this-worldly special interest of the rulers*[37]

'The second type (of rational politics) is the one concerned with the interest of the ruler and how he can maintain his rule through the forceful use of power. The general (public) interest here is secondary. This is the type of politics practised by all rulers, whether they are Muslims or unbelievers.'[38] (Muslim rulers, however, maintain mixed regimes.)

Unlike the 'arbitrary rule', reason here moderates the baser appetites of the tyrant to prevent loss of power which is his chief desire. Reason assists him in rational organisation of the state and enables the despot to attain his egoistic ends more efficiently, for example, by exploiting the people through taxation and suppressing them through the military and police. This is a patently unjust regime ruinous to culture since there is no law to check or superior power to punish the despotic

power group. It is condemned by the *sharī'a* as well as rational political philosophy.

The sharī'a *regime (caliphate, imamate) whose end is this-worldly and other-worldly universal common good* (al-maṣāliḥ al-Kāffa).[39] The *sharī'a* regime is both prescribed by God through the Prophet and established sociologically by the forces of *'aṣabiyya.*[40] Unlike the rational regimes which are the rule of elites over the masses, the *sharī'a* regime is the rule of *sharī'a* over all men, ruling elites as well as the masses. Its end is public interest, or rather the universal common good. It is 'useful for this world and for the other world' unlike the ideal rational regime which is 'useful only for this world'.[41] The bond between the ruler and the ruled is based on an inner compulsion. The source of this restraining power or controller is the belief in God and life in the hereafter. These beliefs metamorphose social life by ridding men of their lower impulses, evil aspirations and mutual jealousies which are the primary cause of classes and conflicts. This controlling power unites men for a cause superior to their individual appetites, group interests, and the ends of power politics in the pejorative sense. This is apparent from the lives and political conduct of the Rightly Guided Caliphs who reportedly jeopardised their government and even sacrificed their life to further the common good prescribed by the *sharī'a.*[42]

The *sharī'a* regime does not deny the natural desire for preservation of life, which is the end of primitive cultures, and the enjoyments of the advanced social life called civilisation, which is the end of rational regimes. It is more effective in aiding man to acquire mundane ends and goods because the *sharī'a* knows best what they are and it has a better understanding of public interests. The scope and context of the virtues of rational regimes such as justice, moderation and public interest are brought by the *sharī'a* regime within the purview of its wider horizon of man's ends. The enjoyment of this world (*al-dunyā*), which is supremely important for a Muslim,[43] becomes according to the *sharī'a* hierachy of values an instrumental end serving the terminal goal of man's felicity in the hereafter. The *sharī'a* regime, therefore, attends to 'the external and internal goods of culture'.[44]

The offices of the *sharī'a* regime are of two types.

1 Offices which are unique to the *sharī'a* regime, designed to preserve the *sharī'a* and realise its ends through execution of its ordinances. For example, they supervise public prayers; supply opinions on Islamic law (office of *muftī*); administer justice (*qaḍā'*) and conduct Islamic wars. The office of market supervision (*ḥisba*)[45] deals with offences concerning weights and measures, public morality and decency and petty public grievances; and looks after regulation and maintenance of public works, buildings and utilities.
2 Offices which are common to the *sharī'a* and rational regimes. Historically, these offices included appointment by the caliph or king

of ministers, commanders, judges and the like; controlling and regulating legal, educational, and administrative institutions; maintenance of law and order; national defence and war; taxation and finance; and other offices and functions deemed necessary in public interest.[46]

It is important to note the distinction between the two sets of offices, their existence under a single authority in the all-inclusive *sharī'a* regime, and the nature, functions, and types of offices according to the typology of the state and the progress of civilisation.

The chief executive of the *sharī'a* regime, *imām*, is elected by the 'consensus of the community'[47] through the *ahl al-ḥall wa al-'aqd* who are the *ahl al-shūrā*. The caliph and the legislators come from, represent, and are accountable to the entire Muslim community and not any *'aṣabiyyas*. Four basic conditions and qualifications required of them are: knowledge; probity and trustworthiness, due to possession of ethical qualities; competence to perform political and diplomatic duties, administer public interest, lead in war, protect the state and Islamic ideology, and exercise power over nation through control of its power group; and freedom of senses and limbs from defects which might affect judgement and action.[48]

The *sharī'a* regime is superior to rational regimes in all essential aspects: ends; nature of ideas and institutions prescribed; type of coercion, restraining and motivating powers applied and centre of allegiance. Ibn Khaldun asserted that the *sharī'a* regime is the only theoretically possible permanent form of political and cultural order. Rational regimes and their rational-sensate cultures are led inexorably to cyclical fluctuations of growth, maturity, decay, destruction, and rebirth. Mankind can escape these vicissitudes of history only by adopting and remaining ever faithful to *sharī'a* socio-cultural system, including the political subsystem.[49]

Contemporary Muslim politics and Ibn Khaldun's typology

Many major and subtype classifications of developing countries, including the Muslim states, have been made[50] from the viewpoint of Western political democracy.[51] Western studies in political sociology and history of Muslim countries suffer from ethnocentrism.[52] Modern Muslim scholarship has not yet developed a systematic political theory from the 'cultural relativist' perspective of 'Islamic modernity'. An attempt is made here to establish a broad correlation between the modern Western classification of states and Ibn Khaldun's, representing the customary Islamic classification.

Shils classified developing countries on the basis of political and governmental functions into two basic types, democracies and oligarchies, or authoritarian systems.[53] Almond and Coleman adopted this classification. Coleman divided the developing countries into seven subtypes: political, tutelary, and terminal colonial democracies; moder-

nising, colonial and racial, conservative, and traditional oligarchies.[54] According to Almond, the democratic systems give automony to subsystems – political parties, pressure groups and courts; and participants in the political culture are not controlled or regulated. These democracies are subdivided into those with high, limited, and low autonomy. The authoritarian systems are characterised by controlled subordinated subsystems, and a subject role for participants in the political culture. They are subdivided into four groups: radical or conservative totalitarian, and conservative or modernising authoritarian systems. These democratic and authoritarian systems are mobilised or premobilised, depending on whether they have high or limited cultural secularisation and differentiation in political subsystems.[55]

As a first approximation, Ibn Khaldun's rational regimes and cultures might be equated with secularism,[56] including both agnostic and atheistic political and cultural systems. The political democracies of Almond and Coleman might be compared with Ibn Khaldun's rational regime whose primary aim is public interest. Some of their oligarchies and authoritarian systems, such as Almond's radical totalitarian state, are imitations of the Marxist-Leninist or social democracy which must also be included in the same type of rational regime. These political and social democracies stand in the same relation to the Islamic democracy or *sharī'a* regime as Ibn Khaldun's public interest-oriented rational regime. Most of Coleman's oligarchies and Almond's authoritarian systems might be compared with Ibn Khaldun's rational regime whose primary aim is the special interest of the *'aṣabiyya*; at their worst these systems would approach Ibn Khaldun's arbitrary rule.

In accepting these Western typologies as descriptive of contemporary Muslim states, we must recognise some of their limitations from the cultural relativist perspective of Islamic modernity. Some of these issues are discussed in detail in Chapter 7. First, almost all contemporary Muslim states have declared Islam as their ideology, explicitly in their constitution or otherwise implicitly.[57] Despite the Western and Marxist-Leninist influences and machinations acting as challenge, blessing, or curse, there is no justification for looking upon the ideological and technological modernisation of the Muslim world as Westernisation or Marxianisation instead of Islamisation. The trend towards Islamic modernisation might be positive, uncertain, or even negative in the short run. The achievements of contemporary Muslim states in terms of the Islamic ideal must be evaluated with a profound understanding of the Islamic ethos, the very nature of the processes of socio-cultural rejuvenation (especially Chapter 7), and a correct perspective on the brisk pace of current history when fully mobilised diverse ideologies of the developed countries are impinging upon the premobilised Islamic socio-cultural system of underdeveloped Muslim countries. Second, these typologies are based on the fundamental concepts of a Western-style ideal political

democracy which is a wrong standard for judging Muslim states in view of our cultural relativist stance.

Based on the data available to Ibn Khaldun by the end of the eighth/fourteenth century, he had stated that most of the historical Muslim states were mixed regimes.[58] With certain qualifications, this judgement also applies to the actual political patterns of contemporary Muslim states. According to Ibn Khaldun's characterisation, the Muslim mixed regimes follow the *sharī'a* only to the extent that it does not obstruct the ulterior ends of the special interest-oriented ruling power groups. The restraining influence of Islam within each person is replaced by the external constraints of group interest and nemesis, '*aṣabiyya* and the sword'.[59] The head of the state or caliph, assemblymen, and decision-makers who should be representatives of the entire community and dedicated to the common good now become representatives of the power group and guardians of its special interests. The consensus of the community, legitimacy of the government based on a contractual relation between the caliph and the community, and caliphal power degenerate into a mere formality, actual power being obtained and retained through fraud, force, and terrorism. Ibn Khaldun's historical Muslim mixed regimes followed selective political norms of the *sharī'a*, ethical rules, the norms of rational social organisation, examples of the great pre-Quranic Persian kings, and certain necessary demands of force and power politics. All this is best described in the works of medieval Islamic political moralists belonging to the genre called the 'Mirror for Princes'.[60] However, contemporary Muslim states of the new mixed type follow, along with the political norms of the *sharī'a* while searching for Islamic political modernity, the norms and examples of Western political and Marxist-Leninist social democracies. The moral tenor of these latter democracies is that of *The Prince* of Machiavelli,[61] which is incompatible with *sharī'a* political norms and even the Islamic political moralism of the 'Mirrors'. However, there are possibilities of assimilation of their *sharī'a*-compatible concepts and empirical institutions through imitative-innovative processes and 'diffusion by stimulus'.

Comparative politics: methods and contents of decision-making

Political and social democracy[62]

A UNESCO international symposium brought out the ambiguous and contradictory meanings of democracy, and the disagreements among experts on the conception of its ends, choice of means, and the implications and consequences of these factors. Starting with Abraham Lincoln's definition[63] of democracy as the government of, by, and for the people, the UNESCO survey covered two major types of democracy: the Western or political, and the Marxist-Leninist or social democracy. According to Bertrand Russell: 'The Anglo-Saxon definition of "democracy" is that it

consists in the rule of the majority; the Russian view is that it consists in the interests of the majority, these interests being determined in accordance with Marxist political philosophy."[64] Political democracy, connoting the narrow concept of government *by* the people, requires existence of established *methods* of popular control of governmental decision-making, and of *conditions* insuring independence of opinion formation. The conditions include criteria such as 'freedom of expression' and 'access to information on public issues', and might also include social, economic and educational conditions necessary to insure that the methods provide efficiency of popular control of government decisions. Social, including economic, democracy, connoting the 'broad' concept of government *for* the people, puts stress on the *results* and *content* of decision-making. It requires establishing maximum equality of status in *all* respects: power, authority, economic benefits and education. It might even require definite *goals* as well as the *means* to achieve them, such as socialisation of means of production, abolishing private property, government planning and the regulation of economic life.

The opposition of political and social democracy might be formulated around two fundamental questions. The first concerns the relations of non-political *conditions* to *methods* of decision-making: the possibility of free expression of will; efficient control of governmental decision-making; and the cognition and satisfaction of 'real' interests by the masses in a socio-political system based on private ownership of means of production or concentration of economic power in a higher state bureaucracy; and control of instruments of opinion formation and sources of value judgement (that is the education and communication systems) by private or public groups having ulterior and predetermined motives. The second question concerns relations of *methods* to *contents* of decision-making. What methods of control of government decision-making will insure that decision contents bring about optimal conditions for satisfaction of the people's demands and interests? Is it possible to level out inequalities and increase general welfare when the people are given access to methods of control of decision-making in a system marked by trenchant economic and other inequalities?

Protagonists of political democracy assert that popular control of decision-making must be expected to lead to general welfare because people are assumed capable of exercising the controls necessary to meet their demands and interests. Political democracy encourages diversity for articulation of disparate interests; promotes contention, political struggle and bargaining, among special interests; and uses factions, classes, pressure groups and plurality of parties. Resolution of these differences through aggregation of conflicting interests, according to the preferences of the majority, constitutes the public interests or the common good.[65] Any social reorganisation must first meet the test of actual popular preferences thus articulated and aggregated rather than conform with

a priori ideological conceptions of the people's real interests. Protagonists of social democracy assert that popular control of decision-making does not necessarily lead to achievement of general welfare since the people are rendered incapable of knowing and realising their 'real' interests due to existing inequalities. A social reorganisation is a necessary precondition for adequate and efficient control of the methods of decision-making. This type of democracy does not tolerate diversity of opinions *outside* the frame of 'the party of the proletariat'; but *within* it active public involvement is encouraged, and opportunities are created for mass participation in the formation and execution of public decisions. Social democracy envisages the single-party state to take decisions through application of the principles of Marxist-Leninist dialectical materialism.

The Islamic democracy vs 'political' and 'social' democracy

We will discuss here the Islamic stand on the controversial concepts of political and social democracy concerning methods and contents of decision-making.

We recall the basic principles of the ideal Islamic state, and Ibn Khaldun's comparison and contrast of its political culture characteristics with those of the 'rational regimes'. The former is the Islamic nomocracy and the latter is a purely rational or secular nomocracy. The meaning of 'rational regime' as a nomocracy dedicated to the realisation of public interest fits the descriptions of the Western and Marxist-Leninist ideal types of democracy in many important aspects.

Islamic democracy is not only a government of, by, and for the people, a political and social democracy according to the 'narrow' and 'broad' concepts emphasising the methods as well as the contents of decision-making. It is a legal, political, sócial, economic, and cultural, as well as a religious and 'spiritual' democracy. The meaning of Islamic democracy is more comprehensive than both the Western and Marxist-Leninist meanings of democracy inasmuch as the *sharī'a* regime is more comprehensive than the rational regimes as pointed out by Ibn Khaldun.

The fundamental opposition between the Western and Marxist-Leninist meanings of democracy boils down to their insistence on methods and contents of decision-making, respectively. Political democracy accepts compromise among conflicting interests as the method, implying necessarily the acceptance of its consequences, regardless of the results and contents of the decisions.[66] For the dictatorship of the proletariat, on the other hand, the end justifies the means; in the pursuit of the contents of the meaning of social democracy, it 'destroys the methods of procedure essential to democracy'.[67] Thus the protagonists of both political and social democracy divorce means from ends.[68] Islamic democracy postulates a unity and hierarchy of ends and means. This is based on another *sharī'a* principle, *ṣadd al-dharī'a* ('blocking of means'),[69] which is a subtype of the *sharī'a* concept of public interest. Succinctly, this

principle states that whatever action is needed to achieve a lawful end or to promote an established desideratum is itself obligatory; but those means are unjustifiable which lead to forbidden ends or consequences. Thus the methods of democratic decision-making along with their conditions and criteria, and the content and consequences of these decisions along with the means and non-political goals required to achieve them, are equally sacrosanct rather than mutually exclusive. Islamic democracy delineates the principles of the methods of decision-making - *ijtihād*, *ijmā'*, and *shūrā* – as well as the goals and means of the contents of governmental decisions. The latter comprise the fundamental principles of the whole Islamic socio-cultural system: the aims and objectives of the Islamic state; the philosophy, methodology, and provisions of Islamic law, *sharī'a* and *fiqh*; and economic justice specifying the goals and means to achieve it.

The methods and contents and their instrumental values, according to the meanings of Western and Marxist-Leninist democracy, reflect their unilateral materialist or 'sensate culture mentality',[70] whether secularist or atheistic. Islamic democracy takes into account these materialist conditions, criteria and goals, as well as the moral dimension of politics, and the psychic and aspirational conditioning of political man. It is here that belief in God and accountability to Him assume significance in enhancing the efficiency of control of the methods of democracy, and the content of their decisions. This was emphasised after Ibn Khaldun. Since there is no human or other external power above the ruling elites, these transcendental postulates of Islam, if and when made operational as internal constraints, offer solution to the age old problem of how to tame the holders of power and turn potential tyrants into benevolent rulers subservient to law. This brings out the basic philosophical difference in the two personality types. The Islamic political man is inner-directed as well as outer-directed. He imbibes the political characteristics of the Islamic 'integrated culture mentality'. The political elites as well as the masses are subjected to the same inner and external restraints of the *sharī'a*. The Islamic 'religious' institutions – prayers (*ṣalāt*), fasting and pilgrimage to Mecca (*Ḥajj*); in this sense become complementary to and indistinguishable from other socio-cultural institutions relevant to political culture. The political man of the Western and Marxist-Leninist democracy is the creature of the 'sensate culture mentality', the political elites excelling in the 'cynical-sensate mentality'. The secularist Western culture does offer another personality type, that of the ascetic or activist 'ideational culture mentality' but these are not the political or secular men but the ecclesiastics who have no jurisdiction in societal affairs.

Another basic difference between the Islamic and the other two types of democracy concerns their concept of man, human nature, the historical process, and the institutions and attitudes adopted in the pursuit of

human welfare and for combating man's propensities for evil and social injustice. Lenin admitted bluntly: 'The bourgeois state is an instrument of oppression of the working class; the socialist state, of the bourgeoisie. To a certain extent it is only the capitalist state stood on its head.'[71] Proceeding from the fundamental postulates of class antagonisms and economic determinism, Marx derided as purely utopian the notion that one class could and should work for the just and true interests of another class. Therefore, Marxism-Leninism establishes the single-party government, 'the dictatorship of the Proletariat'. Marxism is believed to be the one and only possible 'genuine social science', just as modern physics is a 'science'.[72] The real and genuine public interest is derived from Marxist-Leninist dialectical materialism by 'the party', which is the vanguard of the revolutionary proletarian movement. 'Marxists are revolutionaries ... and whenever they succeed ... they claim the revolutionary right to protect the new order against counter revolution'[73] by suppressing opinions opposed to those of the Communist Party. Environmental planning must also take place within these constraints on methods and contents of decision-making. Western democracy is built on faith in scepticism and ethical relativism. Given the goal of maximisation of particular interests under the realist, utilitarian, or aggregationist premise, public interest is achieved through balance of interests or powers; irrespective of the results or contents of the decision arrived at through the political process as long as certain methods of procedure are used. This is, at best, a modified form of social Darwinism and a kind of methodological formalisation of class conflicts.

Thus Communism and Westernism are one in their political ethos which places primary stress on the significance and conflict of interests.[74] The philosophical roots of both the Western and Marxist-Leninist democracies are their implicit distrust in man or moral cynicism, and their belief in the incorrigibility of human nature – the denial of the primacy and possibility of an ethically oriented societism. In contrast to these sister concepts of the political man, Islam postulates an ameliorist concept of man who, being basically good by nature or the will of God, is responsive to the moral appeal (Chapter 1). Therefore, subjected to an ethical polititical socialisation, he should respond with value-oriented political behaviour. Islamic democracy delineates, on the bases of scriptural revelation and human consensus, absolute and universal, general and specific, ideal values and norms of social justice. Public interest or the universal common good comprises the value-orientation and action-orientation of all individuals, classes and interest groups, and the orientation of empirical socio-cultural institutions, for the implementation of the Islamic primary and secondary systems of values, *sharī'a* and *fiqh*. As discussed in this work, these values comprise the contents of the whole socio-cultural system of Islam including the legal, political, economic, educational, philosophical, religious, and all other possible subsystems.

The methods of decision-making, called the roots of *fiqh* or principles of *sharī'a* (Chapters 2 and 4), are included in this Islamic value system. All must abide by this value system even if its judgement goes against their apparent personal or group interests since such obedience to law is in their real interests in this world and the hereafter. The loser in these decision-making processes is also a gainer since he as an individual attains freedom from evil and injustice, and as a group or nation avoids eventual socio-cultural decline. The winner in the dispute ought to be restrained and generous in pressing his claims lest he 'exceed the limits set by God'.[75] Lastly, there is no doubt that ideally Islam claims to be ultimately the destiny of mankind. However, besides granting the rights of partial and total ideological dissent with Islam within universally applicable limits, the Islamic democracy provides the non-Muslim minorities institutional opportunities to conduct their lives politically as autonomous communities within the Islamic state as far as possible.

Implications of Islamic democracy for methods and contents of decision-making in environmental engineering systems planning

Submission to God (Islam) entails orientation of values, institutions, and actions in conformity with the ascertainable *sharī'a*. Implementation of *sharī'a* religious, legal, political, economic, educational, philosophical, and all other possible subsytems comprises individual and public interests.[76] This definition of Islamic notion of public interest must be borne in mind along with the principles of the Islamic state and Ibn Khaldun's exposition of the political sociology of *sharī'a* regime in the following discussion.

An implication of Islamic democracy for environmental systems decision-making relates to non-Muslims. The right of partial and absolute dissent from Islam granted to non-Muslim citizens of an Islamic state would imply that, at least in the private sector of the economy, the non-Muslim citizens could use, individually and collectively, standards and economic principles conforming with their own ideological culture vis-à-vis environmental engineering systems. The non-Muslim citizen, who prefers not to serve in the military, could possibly also refuse to serve in public services related directly to national defence such as the military corps of engineers. Non-Muslim students would have the right to be taught courses from their 'cultural relativist' perspectives particularly in the humanistic-social sciences stem of engineering education.

Responses of political systems to public interest

The type of political system and the personality type of the elites, engineering or technical, political, bureaucratic, and so on; determine the nature and quality of attitudinal and institutional responses to public interest. This was brought out by Ibn Khaldun's discussion of the ideal

sharī'a and historical Muslim mixed regimes vis-à-vis rational regimes.

There are usually four types of attitudinal responses to public demands by elites: accommodation, substitution, indifference, and repression.[77] These might also be regarded as the heirarchy of responses by Ibn Khaldun's ideal secular nomocracy, or the ideal Western and Marxist-Leninist types of democracy. Accommodative responses lead to political outputs – legislative, executive, and judicial, to satisfy in some measure the demands on the political system.[78] The exact methods and contents of these responses vary with the specific type of state. One form of response against public interest is the resort to conspicuous consumption and waste by building monuments such as mausoleums, cathedral mosques, palatial stadiums, luxury hotels, or even dams, bridges, tunnelled canals, and secretariat buildings of prestigious dimensions. Such constructions, superfluous from society's viewpoint, would be typical of Ibn Khaldun's special interest-orientated régimes and some of Coleman's oligarchies and Almond's authoritarian systems.[79] These are the rule of, by, and for a group of men as distinct from democracies which are the rule of law for public welfare. Inasmuch as the grounds of legitimacy of all modern governments have been narrowed to an overt belief in the pursuit of public interest, there is a premium on dissimulation and manipulation. Thus substitution might take the form of the pursuit of elitist or special interests through rationalisations such as diverting resources from development and welfare projects to militarism, symbolic domestic and adventurous international programmes for the glorification of the leader, nation or ideology. Such attitudes are common to all actual political systems and elites; but an absolute-value orientated system such as the ideal Islamic democracy will condemn them as illegal or blameworthy from the *sharī'a* viewpoint.

Islamic democracy being idealistic and absolute-value orientated, the inner-directedness of its political and technical elites generates a fifth type of attitudinal response to public needs. This might be called 'altruistic voluntarism'. The elites are required to look upon power and authority as a trust. They are motivated through an inner compulsion to anticipate and gratify as far as possible the latent, diffuse, and affective needs of the people before these become political demands.[80] The 'instrumental' style of interest articulation is the primary distinguishing feature of Western political democracy whereby associational interest groups maximise their utility through threats and the use of group power to coerce the political system. Islamic democracy expects the decision-makers to discourage and suppress the pressure tactics of power groups and special interests in the interests of equity, rule of law and the common good. Altruistic voluntarism expected of ruling elites is the moral power working in favour of the weak, poor, and under-privileged who are incapable of such politically manifest and instrumental modes of interest articulation. This principle was declared by Abu Bakr, the first Rightly Guided Caliph, in

his inaugural address: 'The weak among you shall be strong with me and, God willing, he will get what is due to him; the strong among you shall be weak with me and, God willing, he will have to surrender the rights of others'.[81] 'Umar, the Second Rightly Guided Caliph, similarly defined in his inaugural speech the objective of an Islamic government: 'By God, he that is weakest among you shall be in my sight the strongest, until I have vindicated for him his rights; but he that is strongest will I treat as the weakest, until he complies with the law'.[82] Such an attitude found expression in a unique instrument of political communication by Islamic rulers: travelling incognito like Caliph 'Umar to find public needs and grievances at first hand and make them the basis of governmental action.[83]

An ideal Islamic democracy would also adopt the accommodative, substitutive, and repressive responses as a political system and elite attitudes, but impose on these modes its own meanings. The regulative function of the political system is performed more efficiently by the inner or moral restraints employed by Islam over the elites as well as the masses. This does away with the need for many regulative or coercive powers of the state. Ibn Khaldun had pointed out the substitutive characteristics of Islamic political culture which employs repressive responses but changes their direction (*wajha*) and purpose (*maqṣad*) so as to serve the real public interests and suppress the baser instincts. Such was the case, for example, in the Caliphate of 'Umar, who elicited expert evidence, encouraged special interests articulation by visiting delegations, organised an intelligence service, made inventory and investigations of private property of public officers, established inquiry commissions, and made governors' attendance compulsory at their annual conference during the Pilgrimage to Mecca where in open hearings they were held accountable to the public for their private conduct and public decisions.[84] The translation of these attitudes into institutions of environmental engineering systems decision-making – inquiry commissions, data gathering and dissemination agencies, and public and parliamentary hearings; is a distinguishing feature of the fully mobilised and modernised political democracies. In adapting such decision-making methods and institutions the Muslim governments and environmental agencies must keep abreast of innovations in science and technology while utilising the permanent values and innovative interpretations of Islamic law, politics and environmental engineering economics.

Another qualitative transformation required by an Islamic democracy is the replacement of 'symbolic'[85] or ostentatious output of the political system and its elites by substantive welfare capabilities. This is essential if the economic, educational, and other equalitarian and distributive capabilities of the social welfare function of the Islamic democracy are to be realised. This is brought out most dramatically in the attitude of contempt for pomp, court pageantry, construction activity for luxury and prestige of the elites which characterised the Islamic democracy under

Caliph 'Umar. Such symbolic outputs by government and conspicuous consumption of resources by the people were equated with kingly political system in contrast to the norms of the political economy of the Caliphate.[86] To a delegation from Kufah, Iraq; Caliph 'Umar gave the guideline for building construction code: 'What does not lead you to wastefulness and does not take you away from purposeful moderation'.[87] This Islamic principle should be adopted in modern states by public housing construction agencies and, in the private sector of the economy, through controls imposed on and by banking and other lending institutions, municipal and other government agencies in charge of implementing building codes and fiscal policies, and so on. This will remove and prevent blights on human and physical environment such as depopulation of rural areas, urban slums, and squatter settlements amidst a few luxury apartments and office buildings. The repression of symbolic and conspicuous waste in 'Umar's Caliphate went hand in hand with the investments in social and economic infrastructures: construction of roads, water resources systems, and houses; land development for agricultural and urban uses; investment of human and capital resources in public education, including the intensive use of mosques as prayer halls as well as schools, and centres of community life and political activity; and the creation and expansion of social services. Thus the Islamic democracy is characterised by high welfare, equalitarian and distributive capabilities; these in turn depend upon a high 'extractive capability', that is, the system's capabilities to mobilise material and human resources and the latter's latent psychic and altruistic potentialities to attain the ends of the *sharī'a*. Attitudinal responses to public interest must be translated into voluntary and governmental organisations. These are the institutional responses of the political system to public interest. The development of infrastructures in 'Umar's Caliphate required the establishment of public agencies and the expansion and adjustment of existing government departments. Thus the departments dealing with agriculture became public service organisations. Under the Roman rule these departments were merely revenue extracting agencies serving the special interests of the ruling oligarchy comprising the military establishment, the Church, and absentee landlords.[88] We described after Ibn Khaldun the governmental institutional responses in the form of administrative departments common to medieval non-Muslim and Muslim states, and those unique to the latter such as the departments of *ḥisba* which regulated, maintained, and controlled public works and utilities, food and market, weights and measures and labour interests. For an understanding of such innovations made with the inception of the Quranic-Muhammadan political system, we must again refer back to the first Islamic democracy in the early first/seventh century, particularly under Caliph 'Umar. There we find the genesis of differentiation in the rule making, rule application, and rule adjudication functions of government, and their departmentalisation and

bureaucratisation. The public treasury (*bayt al-māl*), was established to receive revenue from such sources as the progressive taxes on income and wealth in excess of pre-established minimum bases (*niṣāb*). This financed investments on infrastructures, salaries of public employees including the Caliphs, and stipends for Muslims and non-Muslims on welfare rolls.[89]

The sociological and technological problems of modern times require similar attitudinal but new institutional responses for the development, management and protection of environmental resources. Emerging Muslim nations must adapt through imitative-innovative processes the organisational responses to these problems from the more developed and mobilised nations, and the international organisations developed by them. The attitudinal characteristics of the Islamic political system, its principles of decision-making and its concept of public interest, are capable of solving the modern problems of environmental resources management by adapting these instrumental institutions belonging to the universal rational realm of culture, that is, 'technological' culture.

Principles of decision-making methods: the shūrā *method of decision-making*

The goal of decision-making methods is settlement of an issue as a prelude to action. Different types of value-, institution-, and action-orientation, and therefore, different concepts of public interest and the common good are implied by the different decision-making mechanisms. The normative, idealistic, and absolute-value orientated characteristics of Islam imply that nothing in the Islamic system can be a purely political or economic issue. These issues are juridico-political or juridico-economic in the sense that the norms, ideals, and absolute values of Islam systematised as primary and derived law delineate and provide constraints for the political, economic, and other concepts, categories, and institutions.

Partisans seeking settlement to an issue might, according to Banfield, resort to seven broad methods: co-operation; accommodation; contention, involving either political struggle or bargaining; competition; arbitration; dictation; and mixed methods.[90] A more elaborate scheme of the mechanisms of co-ordination among partisan decision-makers in a political democracy was presented by Lindblom.[91] For example, dictation implies the imposition of a settlement on one partisan by decisions made exclusively by the other party. 'Authoritative prescription', 'prior decision', 'unconditional manipulation' and 'indirect manipulation' as defined by Lindblom are methods which impose decisions through the exercise of power and force. These methods are characteristic of certain oligarchies and authoritarian systems, and in a modified form the single party states, including the Marxist-Leninist social democracy. These regimes are similar to Ibn Khaldun's rational regime ruled by *'aṣabiyya*,

or al-Mawardi's *imarat al-istīlā'*. Such methods of decision-making are illegal from the *sharī'a* viewpoint which accepts only decisions made freely through independent exercise of judgement and consensus, provided also the ends and consequences of these decisions do not violate the values, norms, and prescriptions of the *sharī'a* and *fiqh*.

Arbitration, and related means like mediation, conciliation and adjudication, are approved Islamic methods of settling political disputes. Codified and statutory laws and regulations, and the more technological specifications and standards, conforming with Islamic law, political economy, and philosophy are guides and aids in decision-making. These are essential for rational environmental systems decisions. On the other hand, administrative and political decisions, and substantive law (*fiqh*) enactments would be subject to over-rule by the judical process on the authority of the fundamental law or *sharī'a*; this is essential to achieve consistency and avoid arbitrariness. Due to the ideological orientation of Islam, postulating conformity of all types of decisions with the fundamental law and constitution, the *sharī'a*, these judical and quasi-judicial methods of making and validating decisions assume special importance. Environmental engineering systems disputes would be equally subject to settlement by these methods of decision-making.

According to the model of political democracy, 'contention'[92] entails exercise of power to overpower adversaries, or otherwise reach an agreement most favourable to the party holding the balance of power. A special case of contention is 'bargaining'[93] which entails employment of various 'strategies' by the parties to the conflict. Each party might try to increase its own fund of special knowledge relative to that of its adversaries since this is a source of political power. Each contender tries to impose on the others actions optimum from his own point of view; to extracts concessions from other contenders, and is induced by or forced to offer concessions, on the basis of the distribution of power among them. The settlement reached by bargaining, or similar manipulative methods such as negotiations and partisan discussion, is a compromise. This compromise reflects only the balance of power among the contenders under the conditions in which it is reached. Contention, bargaining and negotiation, according to these particular conceptions, are the predominant methods used in political economy decision-making in political democracies, including the development, conservation and use of environmental resources. The consequences of these methods of decision-making for environmental resources in the USA are critically evaluated later in this chapter. Due to the divorce between the methods and contents of decision-making in the model of political democracy, these methods are neither designed to achieve, nor do they actually realise, the public interest and the common good. In Islamic democracy, however, these methods would be applied according to their Islamic meanings by all contenders to realise the agreed standards of *sharī'a* and *fiqh* vis-à-vis

environmental engineering system planning. This constraint on the results of decision reached through compromise was expressed by Caliph 'Umar: 'Compromise is permissible, provided it does not turn the unlawful into lawful and the lawful into unlawful'.[94] Compromises with fundamental values, such as Islamic human rights and social justice, through the sole arbitration of power politics as in political democracy, are conditionally permissible only under dire necessity or constraint (Chapters 2 and 4).

Islam also enjoins politics of confrontation (*jihād*, literally 'striving') in self-defence, and to redeem the Islamic universal human rights and social justice. This political *jihād*, and its escalation into military *jihād* (*qitāl*, fighting or war), must take place under certain universalistic *sharī'a* constraints after efforts for peaceful resolution through the Islamic processes of consultation have failed. This confrontation or *jihād-qitāl* model cannot be invoked to deprive others of *sharī'a* rights through exercise of power politics.[95]

The Islamic decision-making process *par excellence* is the *shūrā* model with *ijtihād* and *ijmā'* as its decision-making procedures. The consultation model is applicable in all normal political decision-making situations. It leads to co-operative decision-making through the search for a solution by all interested and competent parties on the basis of mutually agreed *sharī'a-fiqh* terminal and instrumental goals. The ends are designated by primary *sharī'a* goals, or the Islamic meanings of public interest and the Islamic principles of environmental political economy, and their more specific delineation by such outputs as a *sharī'a*-derived water code, statutory laws, regulations and economic criteria. Similarly the means are designated by the primary *sharī'a* methods of decision-making comprising the *shūrā* processes, *ijtihād* and *ijmā'*; and their elaboration into secondary methods of procedure in legislative, administrative, and judicial decision-making. Despite the diversity and differentiation among the decision-makers based on their special interests, functional specialisation, membership in diverse private organisations and public agencies, they must engage in a co-operative search for the optimum solution implied by the Islamic ends and means which they agree ought to be decisive. Co-operative decision-making requires a will and commitment for accommodation; that is, the participants freely and willingly choose the ends of one another even if that produces unfavourable consequences for their particular interests. Their Islamic absolute-value orientation requires them to choose a solution on its own merits, and abjure pejorative *'aṣabiyya*, that is, 'blind support of one's group without regard for the justice of its cause'.[96] Special interest groups such as labour and professional unions and those related to alternate uses of environmental resources might exist; but their goal and function might be information gathering and dissemination, rather than *a priori* unconditional loyalty to special or vested interests, and contention through pure pressure tactics

and power politics. Co-operative and accommodative decision-making require 'competition' among all decision-makers under certain conditions. 'And help one another in righteousness and piety, and help not one another in evil and aggression'; and 'vie one with another in virtuous deeds'.[97]

Competition is indispensable also to achieve efficiency criteria, otherwise there will not be enough alternatives to choose the best among them (*istiḥsān*, Chapters 2 and 4). Such co-operation, accommodation, and competition achieve real public interest and the universal common good; these cannot be achieved through methods of decision-making which lead to the arbitration of raw power; and concessions and compromises under duress and in the absence of objective standards of public interest such as those of the *sharī'a* and *fiqh*. This is in opposition to methods of decision-making of political democracy based on distribution of power among contenders and compromise among competing ends without concern for justice.[98]

However, there are situations as discussed in welfare economics[99] when a decision affects some favourably and others adversely though the decision itself might be desirable. Avoiding inequity requires 'compensation' by those who gain to those who lose in consequence of the decision. This problem is covered in Chapter 4 by the *sharī'a* maxims dealing with torts, equitable relief, limits of relief for damage, liability of wrong-doers, and so on.

The above discussion on the principles underlying methods of decision-making, being normative, is more directly applicable to situations, where ideology and principles of policy-making are at stake. These principles are applicable at various levels of national and international decision-making. Decision-making could be confined to purely technological alternatives in the material, normatively *mubāh*, or the universal rational realm of environmental engineering systems. According to the principle of 'blocking of means', instrumental goals are always subservient to humanistic terminal goals, have no intrinsic value, and cannot be pursued as autonomous goals: only when human interests are at stake is there a valid situation for decisions on the optimal schedule for stage construction of a water resources development 'divisible' project; the development or non-development of a natural resource; and choice among technologically efficient alternate designs. Furthermore, the above discussion of ideal-type principles of decision methods should not obscure the possibilities of mixed decision-methods and the conditional permissibility of compromises with the ideal under constraint and necessity. For example, should an upstream or downstream riparian state take a unilateral decision then the other state or states could also take unilateral decisions, under the principal of reciprocity, subject to the constraints imposed by Islamic law and the socio-political realities of the time and place.[100]

Concepts of planning for environmental engineering systems

'Planning can be defined as *the orderly consideration of a project from the original statement of purpose through the evaluation of alternatives to the final decision on a course of action.*'[101] Typically water resources systems planning involves the statement of objective through choice of relevant ends, and the ranking and combination of ends; collection of data on various engineering aspects and related environmental resources, and on social, economic, political, and other cultural factors, projections of the future conditions of all these factors; project formulation, and evaluation of alternate plans, including inter-industry and inter-regional comparison of projects; and project authorisation and implementation through decision-making in the institutional setting.[102] From the point of view of general economic development planning, conceptually similar steps are needed.[103]

This presupposes, first, certain means-ends relationships which can be construed as either rational and efficient planning, or irrational, inefficient and capricious planning. We devoted much space in Chapter 3, following al-Ghazali and Ibn Khaldun, to unravel the confused relationships between scriptural revelation and reason, axiologically and epistemologically. Most Muslims are ignorant or misinformed about the correct relationships between *sharī'a* and science, because only a small minority of Muslims are Islamically indoctrinated through relevant Islamic education and socialisation. Rational and efficient planning is impossible without unravelling the relationship between the realms of rational knowledge and the *sharī'a* and its value judgements. Without this a site for a well will be selected through divination[104] and, as it actually happens today among the masses and even otherwise well-educated Muslims, decisions will be made through magico-mystical decision-making methods of the *pīrs* and *awliyā'*, the living or dead saints and mystics.[105]

The normative and ideological ends and objectives, and the criteria for selection, evaluation, and decision-making in the processes of planning are the relevant realms for *sharī'a* and its derivative economic, political, social, legal, and other doctrines. In this sense Islamic environmental systems planning will be comprehensive and not partial. Comprehensive planning connotes the relevance and hierarchisation of the legal, ethical, social, economic, political as well as the engineering or technological ends, objectives, and criteria. Partial planning would imply, for example, engineering-economic determinism, that is, the self-sufficiency of a benefit-cost ratio greater than a certain minimum as long as the project is technologically feasible.

Depending upon the primary orientation of the ends, interests, and the universe of potential direct beneficiaries; planning might be private, to enhance individual interests; special, to enhance conservation or construction interests; corporate, to maximise corporate profits and organ-

isational empire building; communal, to enhance public or national interest; or regional, to optimise benefits to all riparian nations through a river basin project, or to smaller geographical and political jurisdictional units such as a region whose people are socio-economically deprived. The implications for these types of plan-orientation are explicit and implicit in the Islamic concept of public interest and the universal common good. The pursuit of the common good would imply, according to the *sharī'a* maxims discussed in Chapters 2 and 4 and the characteristics of the ideal Islamic state and *sharī'a* political culture; the preference for the larger interests and those of the many against the private interests and those of the few, subject to the welfare and equity criteria implied by decisions through co-operation, accommodation and compensation. On the other hand, Islamic planning principles will seek to realise income and wealth redistribution as the priority goal even at the expense of economic efficiency criteria, if need be. It may be neither necessary nor desirable to make certain types of environmental resources projects the instruments of welfare economics. This might necessitate a more vigorous pursuit of alternate plans in other sectors of the economy.

Environmental resources systems planning is aimed at socio-economic development for the furtherance of public interest and the universal common good. The legal, educational and research, political, and philosophical constraints on planning are implicit in the discussions so far. The economic and environmentalist aspects of planning are disussed in the next chapter.

Discussion

The preceding discussion brings up the correlation between the types of states and political cultures, and the methods and content of decisions in environmental engineering systems planning. This is an area of research which has not yet attracted a systematic study even among the small but pioneering group of engineering-political economists and political economy-environmental resources experts in the USA.[106] Since environmental resources development is implied in economic development, one could establish an implicit relationship from studies that show the relation between political typology and economic development.[107] Cultural historians and sociologists have pointed out that decline of technology in many civilisations, for example, the water resources systems of the Tigris-Euphrates of the AD fifth, first/seventh and, following the Mongol destruction, in the seventh/ thirteenth centuries; took place not for want of technicians and technology but due to socio-political disorganisation.[108] Therefore, the first principle of Islamic political philosophy is that Islamic culture must assume control and direction of the entire socio-cultural system. The Muslim engineer and technologist must be an active participant in national and international political economy decision-making, particularly in matters related to environmental resources management

and development planning in general. The Islamic 'integrated cultural mentality' demands 'integrated engineers', some of whom should be engineer-statesmen as implied by the principle of *farḍ kifāya* (Chapter 3). This was best exemplified by the scientist-philosophers and scientist-politicians in medieval Islamic civilisation. In the developed countries of the East and West, engineers in general and the generalist-specialist engineers in particular are trained to become engineer-managers, organisers, defenders, and leaders (Chapter 3).[109]

The ideal type Western political democracies legitimise conflict and contention as normal political processes. The aggregation of diverse interests through the pragmatic bargaining processes leads to settlements expressing the distribution of power among the partisans in decision-making. The interests which do not surface as institutional groups, and the disadvantaged who cannot articulate their interests in politically manifest and instrumental manners, will not be accounted for in the calculus of power. The decisions made nominally in the public interest are in reality expected to be more or less a cumulation of the interests of the various publics weighed in proportion to their political power. The concept of political democracy as a method of decision-making, and the instrumental and pragmatic bargaining styles of interest articulation and aggregation preclude any absolute-value principles, and standards of controlling decision-contents; if any such principles, criteria, and standards are established, they must be manipulated and substituted to suit the special interests of the partisan decision-makers in conformity with the basic premises of political democracy. For the results and consequences of decisions must conform with the results of struggle and bargaining through the arbitration of power, not principles. Many studies of the methods and results of decisions made in the development, conservation, and use of environmental resources in the USA, such as by the Inter-University Case Program,[110] constitute statistical data for a test of the fit of this model of political democracy. Methods of procedure and criteria for measurement and evaluation of water resources systems were proposed by the US Inter-Agency Committee on Water Resources for use by the government agencies.[111] Review of project reports prepared by US federal and local agencies showed serious errors, discrepancies, and deviations when compared with the established standards for project evaluation.[112] The reason for this should be sought, aside from the degree of uncertainty inherent in planning, not in inputing to the engineers' and other public evaluators' ignorance of these standards, but more fundamentally in the decision-making model of political democracy. These results and consequences are immanent in the model system.

The ideal type Islamic democracy postulates the harmony of ends and means, the *sharī'a* methods and contents of decision-making. These must be expressed in statutory and administrative documents beginning with the state constitution; fundamental codes of environmental engineering

systems; subsidiary statutory laws; administrative regulations and specifications and legal decisions. Conformity with these documents constitutes *sharī'a*, public interest and the universal common good. The success in developing the required attitudinal and institutional responses, and in realising the specific methods and contents of decision-making, will be in proportion to the efforts made in socialising the political man in conformity with the ideals of Islamic personality type and interpersonal relationships. This puts the focus on political education, communication, and recruitment. Success depends not only on law-abiding decision-makers; they and the *sharī'a* state cannot exist without a law-abiding citizenry.[113]

The pre-mobilised and underdeveloped condition of Muslim states calls, first, for a statement of Islamic political philosophy and, second, imitative-innovative assimilation of particularly the universal rational political institutions of developed Eastern and Western nations relevant for environmental engineering systems planning. The great virtue of Western political democracy, in contradistinction to Marxist-Leninist social democracy, is its insistence on democratic methods of decision-making and the corresponding empirical institutions. These institutions are best amenable to Muslim imitation, with and without modifications, to materialise the ideals of Islamic democracy. This will transform the theoretical Islamic model into a living system with empirical instrumentalities comparable to, for example, the vast network of voluntary and governmental organisations so characteristic of environmental engineering management in the United States. Islamic democracy shares with Marxist-Leninist democracy the concern for contents and goals of decision-making, albeit according to the Islamic philosophy of political economy. This would mean that the Islamic meanings of democracy, planning, public interest and the types of political responses to its articulation and the *shūrā* process with *ijtihād* and *ijmā'* as its methods of decision-making, will have to be incorporated in the organisational structures and political processes at all levels. For example, the *shūrā* process of decision-making must operate in the interactions between the community, legislature, executive and judiciary. Within the executive branch of government, it must operate between bureaucracies such as the Ministries of Environmental Resources and Finance, and within a Ministry among its divisions and subdivisions on the basis of areal, functional and other distinctions. An example of 'inter-industry' decision-making in a Department of Transportation would involve consultation processes among divisions dealing with roads, railways, airways, inland waterways, and rapid transport systems; and an 'intra-industry' situation for *shūrā* decision-making within a division of Water Resources would involve agencies dealing with irrigation, flood control, conservation, fisheries and wildlife, pollution control and recreation. The nature and structure of organisation of the community, state and government; and the extent of

their specialisation and bureaucratisation will depend upon the degree of development or cultural sophistication of the country; these are universal rational or technological aspects of political culture. In contradistinction to that is the ideological or *sharī'a*-orientated political culture discussed in this chapter whose meanings must pervade the technological aspects of political culture.

In view of the axiological scope of this study, issues and concerns dealing with the ideal Islamic democracy were emphasised in this chapter. However, mention was made of the fact that most of the contemporary Muslim states have illegal governments from the *sharī'a* viewpoint. These governments, established and maintained by power groups through the use of force and repressive measures, that is, *imārāt al-istīlā'*, are one type or another of oligarchy or authoritarian system, radical (left wing), or conservative (right wing). To the extent that they are mixed regimes, they often follow Islam more as a religion and in the realm of Islamic personal and family laws, and much less in matters dealing with Islamic constitutional law and political economy. The Islamic methods and contents of decision-making will become relevant only when these Muslim states adopt completely the model of the *sharī'a* state and political culture, or Islamic democracy, outlined in this chapter.

6 Islamic welfare economics and its implications for environmental engineering systems planning

Introduction

Chapter 1 summarised the Quranic personal and social ethics. God, the real owner of the resources of the heavens and earth, has made them subservient to man, His vicegerent on earth. The proper exercise of the right of usufruct over these resources for the benefit of all the creatures of God is an ethical challenge and the purpose of this vicegerency. The ultimate criterion of whether one is a real Muslim, or a hypocrite and disbeliever in Islam depends on whether or not one practises creative, altruistic humanism by seeking individual welfare through collective welfare. Economic egalitarianism is the touchstone of Islamic social justice.

Chapter 4 brought out the relation between Islamic law and economics. The concept of *istiṣlāḥ* includes economic welfare. Some of the *sharī'a* legal maxims are directly related to economics: purely economic activities as a means to achieve general human welfare are encompassed by, and subordinated to, the processes and content of Islamic law which provide value-judgements for social justice.

Chapter 5 described the objective of Islamic state and culture as universal common good in this world and the hereafter. This is in contradistinction to an other-worldly or ideational cultural mentality, which hinders economic progress, as well as a this-worldly or sensate cultural mentality, whose objectives are restricted to satisfaction of material needs through economic utilitarianism and hedonism. Therefore, the institutional or other economic theories of the latter system are qualitatively different from those of the Islamic integrated or idealistic rational cultural mentality in forms of economic organisation and basic economic concepts such as value, utility, price, wages, profit, capital, time, and welfare economics criteria.[1]

Islamic philosophy rejects 'externalistic economic theories'[2] which impute economic changes to factors external to man such as the cosmic, biological, psychological, demographical, technological and geographic factors, and market mechanics, investment and historical dialecticism. The Islamic concepts of vicegerancy and freewill encumber man with the responsibility of being his own mover, and the moulder of the factors of

nature and the socio-cultural system. Man's limited freewill, relative to God's absolute freewill and predetermination of the cosmic order and the socio-cultural milieu, provide the ethical challenge and opportunity for his 'interference in the flow of nature and history, his diversion of that flow away from value-violation towards value-realisation' (Chapter 1). Thus consumer preferences, production functions of firms and industries, supply and demand, monetary and fiscal institutions and policies; in short all human, physical, and institutional factors in the production and distribution of goods and services must be subject to man's deliberate individual and social choices. This direction must be provided by the value-judgements of Islamic political economy rather than by mechanistic, technological determinism, or economic determinism of different types such as *laissez-faire* economics, free enterprise market forces and the economics of dialectical materialism. This implies regulation and control of economy by the methods and contents of decision-making of *sharī'a* democracy.

Chapter 3 discussed the Islamic epistemological classification into rational or positive knowledge, and the value-oriented or *shar'iyya* sciences. Economics might also be divided into 'positive economics' and 'welfare economics.'[3] Positive economics explains the working of the economic system and what actually exists. It belongs to the universal rational realm of knowledge, and is subject to imitative-innovative assimilation by Muslims based largely on sociologically 'praiseworthy' constraints. Welfare economics is pervaded by value-judgements[4] for it examines what ought to be done and prescribes policies. It falls within the purview of the *shar'iyya* sciences and is subject to their value-constraints for development through imitative-innovative processes.

This chapter discusses only Islamic welfare economics.[5] As a part of the integrated Islamic social welfare function, the Islamic economic welfare function describes the economic goals and objectives, and the principles and criteria for the economic welfare of individuals and society. Then the implications for fiscal planning are discussed in relation to environmental resources development in general, and for specific issues such as the criteria for pricing and investment policies in public works planning and management. The following terminology is adopted. *Personal spending* is what an individual spends on consumption and saving (investment), for himself and his nuclear family. *Private spending* (charity, philanthropic contributions), includes what an individual spends for his extended family, any member of the human society at large, and any social cause through organised or unorganised charity. *Public spending* connotes all government expenditures whose sources are government revenues through any type of tax or beneficiary charges. *Social spending* includes private and public spending. The Quranic call to 'spend' (*nafaqa*), *zakāt* and *sadaqah* stands for total social spending.

Islamic economic welfare function: objectives, principles and criteria[6]

The concept of human welfare discussed in the Quran refers to the pleasures and pains in the hereafter, and objective criteria in terms of economic desiderata such as food, education, housing, other goods and services, and the non-material commodities like leisure, and love and compassion between spouses. It sets priorities for satisfaction of certain 'merit wants,' avoidance of 'unmeritorious' wants, and motivates men to mobilise human and material resources to satisfy 'public wants.' The Quran prepares men to pass through the vicissitudes of life with a minimum of psychic pain incident to loss of life, property, honour and expectations, or no pain at all. Thus the Islamic criteria of human welfare are physical and material as well as psychic and eschatological. The Quran creates the motive for men to feel psychic pleasure through altruistic public and private spending rather than believing and acting upon the postulates of hedonistic economics such as the disincentives and marginal disadvantages of taxes. The economic moral science of Islam seeks to meet, as well as modify, human wants, desires, and preferences. An important principle of the integrated cultural mentality of Islam is that the economic welfare of man is not the measure but a very important instrument of his total welfare.

A general outline of this Islamic economic welfare function comprises a few basic economic principles and objectives, principles and criteria of social spending, and the integrative role of the Islamic state in prescribing fiscal policies through socio-political decision-making. The discussion is restricted mostly to environmental engineering economics.

God's ownership of the universe

God is the creator and absolute owner of all the forces and resources in nature. 'To Him belongs whatever is in the heavens and . . . the earth and whatever is between them and . . . beneath the soil.'[7] God is the creator and bestower of the rational faculties like 'hearing and sight and hearts'[8] by use of which man produces goods and services.[9] These basic components of human and natural factors of production are bestowed upon individuals and nations unequally.[10] In the production process man can claim only partial credit for his labour and the exercise of God's gift of freewill. For men to claim as the return for their 'knowledge'[11] (that is, technology and entrepreneurship), exclusive ownership and unlimited right of use of goods and services produced is a denial of all the gifts of God. That is the basis of the hedonist and individualist economic ethic which contributes to maldistribution of income and wealth among men and nations. God's creation and absolute ownership of geophysical forces and resources, His granting to individuals and nations unequal talents and opportunities, and therefore God's claim for His share of income and wealth are the starting points of Islamic moral economy. God's share of

the production must be spent for altruistic private and public ends. 'Spend of that which We bring forth from the earth for you all.'[12] 'Spend of that whereof He has made you heirs.;'[13]

Universal human brotherhood, equality and economic trusteeship

All men and women are equal because of their evolution from the same substance, their common descent as 'children of Adam,'[14] and their same basic endowments, duties and rights as God's vicegerent on earth. The various kinds and colours of animals, fruits, flora and fauna, and the geomorphologic diversity of the earth are a source of beauty and economic benefit for mankind.[15] Similarly the 'diversity of their colours and languages'[16] among people should contribute to richness of civilisation. The differences in talents and preferences among people should be a source for specialisation, multiplicity of goods and services, and higher standards of living.[17] Such natural differences should not be the cause of *a priori* discrimination and economic inequality. Ultimately superiority is based on precedence in obedience to *sharī'a*. 'Mankind is a single nation.' 'O mankind, surely We created you from a male and female, and made you nations and tribes that you may know each other. Surely the noblest of you with God is the most dutiful of you.'[18] God's geophysical laws and resources are the means of livelihood for all humanity (and other creatures), thus establishing the economic trusteeship of man.[19] These factors of production must be available to all men regardless of whether or not they believe in God and follow Islam.[20]

The concept of human dignity according to the verse, 'And surely We have honoured the children of Adam,'[21] also implies economic trusteeship of all resources. Physiological, inherited, and man-made socio-cultural factors should not be allowed to violate human dignity and impose economic liabilities such as discrimination between the elites and the masses,[22] and by preventing the economically disadvantaged from assuming positions of leadership.[23] The detailed legislation in the Quran on family laws[24] is an example of purposeful politico-legal intervention to restore socio-economic equilibrium in rights and duties for women who are disadvantaged relative to men due to physiological reasons and the social roles expected of them.

The Quran points out that the inequality in endowments and opportunities among men and nations is by God's design. Its purpose is to provide the milieu in which men and women might prove their ethical worth (Chapter 1). The establishment of substantive equality in the real world is an ethical ideal and command. Those who recognise their relative advantages and expend their life and property to establish an egalitarian society are the true believers in God and 'thankful' to Him (*shākir*), and those who do not are hypocrites and unbelievers for whom the Quranic term is *kāfir*.[25]

Mutual economic aid and co-operation

Mutual aid is a pervasive doctrine causing both co-operation and cleavages between individuals, communities and nations.

The primary mutual aid society is the family, both the nuclear and extended.[26] Members of a family are made a community of economic interests by Islamic law of inheritance which settles benefits on the deceased's spouse, descendants and ascendants according to fixed ratios, also making it possible to meet the special needs of near and distant relatives, and social causes through gifts, bequests and trusts.[27] Mutual assistance between individuals and society takes many forms, from day-to-day productive work[28] to contributing one's life and wealth for defence or for liberation from oppression.[29] Collective action must be undertaken to promote social good and forbid social evils[30] such as ending economic oppression and maldistribution of wealth,[31] and protecting the economic interests of the weak and disadvantaged.[32]

The economics of mutual aid and co-operation offers concepts and institutions diametrically opposed to those of the economics of self-interest, conflict of the opposites, struggle for existence and survival of the fittest. All human resources are one and indivisible. There should be no distinction between labour, entrepreneurs, managers and capitalists. They should not be mutually hostile classes, each pursuing its special rather than the common interests. The intersecting demand and supply, or utility and cost, of production curves presume conflicting forces jostling against each other to make the most of the weaknesses of buyers against sellers, of men (labour) against money (capital), and so on. Mutual aid requires co-operative organisation of all economic activities on the principle of 'partnership' *(sharika)*[33] so that all men together share profits and losses while contributing their efforts and endowments – labour, technical and managerial skills, and savings. This would disallow pure profits generated by scarcity value of goods and services in the absence of an upward shift in the real cost of production. Similarly wages will not be determined by the marginal productivity of labour, when it is declining, so as to transfer part of the labour product to private entrepreneurs, capitalists and managers. The aim here should be to recapture the pure or excess profits in behalf of the society to be commonly shared.[34]

'Do they apportion the mercy of your Lord? We portion out among them their livelihood in the life of his world, and We exalt some of them above others in rank, that some of them may take others in service. And the mercy of your Lord is better than that which they amass.'[35] This verse has been rightly explained by Islamic scholars for more than a millennium as an allusion to differences in physical endowments, human talents, intentions and efforts which should give rise to division of labour and specialisation.[36] This calls for mutual dependence and exchange of goods and services instead of chasing the illusive and inefficient objective of individual and national self-sufficiency.[37] The 'law of comparative advan-

tage' (or greatest *relative* efficiency),[38] is another application of mutual aid economics favouring international trade and economic co-operation.[39]

The political aspect of this mutual aid principle is the consultation-consensus model of decision-making of Islamic democracy where all participants pursue the common rather than special interests based on the contents of *sharī'a* state (Chapter 5) such as the mutually agreed Islamic economic criteria.

However, there should be no mutual aid and abetting in defrauding others of their economic and other rights. Unconditional loyalty to kinship and other affinity groups is forbidden[40] because it hurts the public interest and the common good of all mankind. Such unscrupulous group loyalty (*'aṣabiyya khābitha*) among capitalists, entrepreneurs, skilled and unskilled lab our organised as associational interest groups (see Chapter 5), creates schisms in society. This leads to struggles for concentration of wealth and power, socio-economic injustice, political cleavages, class wars, and ultimately to the fall of nations and civilisations.[41] Mutual aid permitted by Islam requires unity and co-operation for social justice and against all those who work for socio-economic injustice and oppression.[42] This might require even waging a war against an unjust group of intransigent fellow-Muslims.[43]

Methods of acquiring income and wealth

According to the general theory of individual duties and responsibilities, rewards and punishments should be on the basis of one's work.[44] From repeated Quranic use of the terms earning (*kasab*), recompense (*jazā'*), and wages or reward (*ajr*) can be derived the principle that individual work, manual and intellectual, is the primary means of acquiring income and wealth. 'And man can have nothing but what he strives for.' 'For men is a share of what they earn. For women is a share of what they earn.'[45] People are exhorted to 'seek the bounty of your Lord' even during the Pilgrimage to Mecca and on Friday with some limitations such as those on economic activities at the time of prayer.[46] The benefits of the economic process should be in terms of effort rather than output as is done by the uncontrolled market system. More or less equal rewards should be given to all those who work in some capacity in the socially requisite (*farḍ kifāya*) occupations (Chapter 3). This would disallow an arbitrary 'pure economic rent or surplus' going to entrepreneurs; capitalists; owners of a resource with inelastic supply in a free enterprise or mixed economy; or to public managers of nationalised enterprises; and the party elites in a 'social' democracy.

The ethics of individual effort prohibits all forms of beggary including public assistance in the form of direct pecuniary transfers to individuals who are able to work.[47] Income should be acquired in exchanging goods and services through mutual consent, without fraud or coercion.[48] Individuals have only the right of beneficial use of natural resources; these

resources cannot be made the source of unearned income and wealth such as through the sale of public water, and absentee landlordism or share-cropping. The inability to exercise the right of use granted by the state, such as disuse for a protracted period, should make the resources revert to the original owner. The state is the owner of 'what belongs to God.'[49]

Income and wealth cannot be acquired by causing damage to others or the society by imposing external diseconomies or spillover costs.[50] The production and exchange of goods and services explicitly prohibited by the *sharī'a* (Chapters 2 and 4), or socially blameworthy (Chapter 3), that is, the unmeritorious social wants are an unlawful economic activity. These include manipulating data to overestimate social benefits and underestimate costs in economic evaluation studies; withholding information on competitive or substitute goods by not presenting alternate plans of projects (analogous to defrauding in weights and measures[51]); misappropriation of private or public funds; and accepting gifts, favours, and bribes to make unobjective decisions;[52] the use by public administrators of privileges of office to live and work ostentatiously at a standard of living higher than that of the masses (Chapter 5) unlike the Prophet Muhammad and other model personalities. Also classified are the distribution of goods and services which violate human dignity by aiding and abetting sexism and conspicuous waste in tourist and recreation industries;[53] breaking and evading agreements[54] such as industrial, commercial, and labour contracts, and engineering specifications; economic exploitation by withholding what is due to others[55] through unfair wages, profits, prices and market distortions. Through the understanding of economic theory and under the impetus of Islamic social ethic, Islamic scholars from the first/seventh century onwards have condemned departures from competitive market conditions such as monopoly and monopsony, economic activities of ruling political elites including caliphs and kings, hoarding, profiteering and speculation.[56]

Interest on money consists of three components:

1 the risk premium to cover loss on bad debts;
2 the cost of administering the loan;
3 the scarcity value or opportunity cost of money which might be called pure interest.[57]

The Quran[58] forbids pure interest mainly for two reasons. First, the amount loaned being a surplus for the lender should be given away as tax or private charity to fulfil the redistributive objective instead of being made the source of additional income. Not contributing to the redistributive objective would be an act of ingratitude by the capitalist since God could as well have made him deserving of transfer payments and development finance instead of the owner of surplus resources. Second, it is the moral right of the debtor in straitened circumstances to at least have the repayment of the capital postponed until times of ease. Under the principle of mutual assistance, and indeed for enlightened self-interest,

this is the least that the capitalist can do to make the borrower a self-supporting and tax-charity paying member of society. The best way to achieve this goal is to convert the loan into a grant through public or private transfer mechanisms. To subject the debtor to payment of something in excess over the capital borrowed is an injustice. The fundamental Islamic principle of 'Wrong not, and you shall not be wronged'[59] is violated. This discussion applies also to real capital as in bartering. The Islamic arguments for a ban on interest-bearing loan transactions is based on an ethical judgement for equitable redistribution of income and wealth among individuals, regions and nations. It is a healthy sign of our times that arguments for equity have been used for making development finance available to the less developed countries on easier terms by the report prepared for the International Bank for Reconstruction and Development, *Partners in Development* (Chapter 4). The arguments of positive economics for making development finance loans available at zero or negative interest rates need not be repeated here.

The treatment of equals as unequals would be as unjust as the treatment of unequals as equals in loan transactions. Therefore, Islam permits the return on capital investment in a partnership enterprise in which the partners share profits and losses proportional to their input of capital and/or managerial resources.

However, the ban on payment and receipt of interest does not apply to the accountants' use of a discount factor in evaluating and comparing investments. Islam does not deny the relative scarcity of resources, but requires an efficient allocation of resources among competing uses according to Islamic hierarchy of values and economic criteria.[60] The discount factor used when necessary might be an 'attractive rate of return,' a measure of the real scarcity of capital from the society's viewpoint, or the planned rate of growth of the national economy.

The duty of earning income through individual effort creates the individual's right to work. This must be considered one of the most important fundamental duties imposed on the Islamic state.

Ownership and enterprise: public vs *private sector*

The unlawful methods of acquiring income and wealth discussed above apply with equal force to individuals, private firms and public enterprises. The strictures against waste and extravagance[61] concern technological and positive economic inefficiencies as well as misallocation of resources. The latter is more qualitative, subject to value-judgement and, therefore, an ideological or *sharī'a*-oriented inefficiency. Niggardliness[62] and hoarding[63] adversely affect personal enjoyment of goods and services and mutual aid objectives, and also restrict aggregate demand and productive investment to cause unemployment, depression and technological obsolescence. Neither individuals nor the government are given the right of non-use, or abuse of resources through technological inefficiency. The

restrictions against individually and socially harmful enterprises preclude misuse, that is, misallocation of resources. Thus we do not have absolute right 'to do what we please with regard to our property,'[64] private or public.

The right to own and manage property privately is recognised in the Quran as implied, for example, by the right to engage in trade and commerce and the right to dispose of property as gifts and inheritance. The pursuit of many of the human rights granted by *sharī'a* democracy (Chapter 5), including the right to propagate and inculcate a religion or ideology through educational institutions in the exercise of socio-cultural autonomy granted to Muslim and non-Muslim citizens (Chapter 3) also requires private ownership of wealth, individually and collectively. Consistent with such pre-requisites for the exercise of freedom of choice and conscience in the Islamic state, the question of ownership and management of property and resources must be decided by several other factors.

The postulates of God's ownership of the universe and economic trusteeship of man, without distinction between Muslims and non-Muslims, imply communal ownership of all environmental resources. This would call for nationalisation and internationalisation of many resources. A distinction could be made between public ownership and management of primary resources and means of production and distribution, and limited private ownership and management in the sense of rights of possession and usufruct granted by the state to private individuals and associations. In the pastoral civilisation of the first/seventh century Arabia, the Prophet Muhammad had nationalised pastures, forests and water.[65] To this category must belong all the 'free goods' of God assigned to the trusteeship of all the 'children of Adam' – inland water and ocean resources; forests and soil resources; deserts and wildlife; mines, minerals, and fossil fuels; air and outer space. The delineation of the domains of public and private sectors is ultimately an issue to be decided through the decision-making processes of Islamic democracy. The content of these decisions should be consistent with *sharī'a* jurisprudence and basic law, *sharī'a* political philosophy and *sharī'a* welfare economics.

Some enterprises in environmental resources planning are not subject to the 'principle of exclusion,' or at least the administrative cost would be too high to recapture all external benefits and assign all external costs. All public goods belong to this category. These include non-toll roads and bridges, parks, projects for flood control, navigation and recreation. Within the jurisdiction of the public sector might be included as merit wants those public goods which in the public interest should be provided more or less free of charge such as protected water supply, family planning facilities, and education and training in individually and socially requisite knowledge and vocations (Chapter 3).

'They ask you about the *anfāl*. Say the *anfāl* are for God and the

Prophet."[66] The *anfāl*, literally, are free goods, 'a gain which accrues without one's labouring for it,' or 'an addition received beyond one's due'. To the same category of *anfāl*, or unearned benefits, also belong the spoils of war acquired by Muslims from the enemy without a fight (*fai'*) such as occupied territory and all its environmental resources. 'Whatever God restored to (*afā'*, whence *fai'*) His Prophet from the people of the towns, it is for God and for the Prophet, and for the near of kin and the orphans and the needy and the wayfarer, so that it be not taken by turns by the rich among you.'[67] Whatever belongs to 'God and the Prophet' belongs to the state and the community to be used to run the affairs of the state in a way that the target beneficiaries are the disadvantaged, the lower income people, and the survivors of those who die for a social cause (that is, 'the near of kin' in the verse quoted above). Therefore all unearned gains should be recaptured by society and used to further the redistributive objective of the Islamic economic welfare function. Spill-over benefits or internal economies should not be allowed to accrue to individuals or groups as windfall profits and pure economic rent.

Unlike the artisan-operated handicraft and small-scale industries before the industrial revolution of the eleventh/eighteenth century, modern industry, mechanised agriculture, and the service sectors are often subject to internal economies of scale giving a decreasing marginal cost of production. To this class belong natural monopolies and oligopolies. In such a case when the price charged for goods and services is greater than the average cost; or in industries with a rising marginal cost of production, if the price charged is equal to or greater than the marginal cost; the industry would make pure profit merely as a benefit of the technological production function. Any deviation in the market condition from pure competition would only add to the profits of such enterprises. Furthermore, any divergence between private and social benefit-cost functions would lead to an overestimation of private pecuniary benefits since not all the indirect social costs of public investments in economic and social infrastructures, which provide indirect benefits to the enterprise in question, enter its cost calculations.

These arguments of marginal analysis also apply to the theory of labour value. A surplus in proportion to the number of workers employed will be created if the wages are less than the average or marginal product of labour, as the case may be. As a direct application of the principle of *anfāl*, and on the analogy of *fai'*, all spillover benefits, pure profits or economic rent, benefits due to internal economies of scale, and the surplus created due to the value of unpaid labour[68] must accrue to the state and the community for direct and indirect redistributive expenditures. There cannot be two interpretations on this principle of Islamic welfare economics. However, whether this redistribution should be brought about through taxation in a free enterprise system of personal and corporate ownership, or through nationalisation of the means of produc-

tion and distribution in a socialistic economy is a debatable question. No rigid, doctrinaire assertion can be made on the authority of *sharī'a* in favour of a free enterprise or nationalised institutional arrangement. This is a matter for Islamic democratic decision-making after a study of the particular industry and enterprise.

The internal and external economies discussed above can be socially internalised, theoretically, by either nationalisation or through taxation on industrial and corporate incomes, profits and wealth. To minimise the leakage to individuals of unearned profits, there will be needed a host of politico-legal institutions, and properly regulated and controlled prices, profits and wages, including a ceiling on profits and wages. For administrative convenience and other pragmatic considerations, it is more likely that the larger and more important enterprises will be publicly owned and managed either directly or as semi-autonomous public corporations. The Islamic state might also want to create but recapture the surplus pecuniary benefits in order to make direct public investments and expenditures. When there is a threat to the Islamic primary objective of an economic and socio-political egalitarian society, economic stabilisation objectives, and the proper allocation of resources; there are many *sharī'a* precepts which favour nationalisation of any one or all natural resources, public utilities and of major industries according to their social importance. These *sharī'a* principles which have great conceptual and methodological significance are: *istiṣlāḥ, istiḥsān, iḍṭirār, taysīr,* and reciprocity in international affairs (see Chapters 2 and 4 for additional *sharī'a* concepts); and the principle of 'blocking the means' (*ṣadd al-dharī'a*, Chapter 5), that is, taking preventive measures and adopting positive mechanisms necessary to achieve the terminal goals of the Islamic economic welfare function unless these means are *a priori* unlawful. Some of the *sharī'a* maxims having direct bearing on this question of the realm of public vs private sector are: the precedence of public welfare over private rights and sacrificing a lesser benefit for the sake of the greater benefit (Chapter 4, *Majallah* Articles).

Economic egalitarianism: redistribution of income and wealth through social spending

Chapter 1 concluded that Islam requires individual self-fulfilment through private and public spending. 'And God has made some of you excel others in the means of subsistence; so those who are made to excel give not away their sustenance to those whom their right hands possess so that they may be equal therein. Is it then the favour of God that they deny?'[69] The culmination of the Islamic impulse for economic equality is a measure of the intensive activism and social ethic of Islam.

Sharī'a and *fiqh* provide the legal and other socio-cultural foundations to achieve the egalitarian ideal (Chapters 2 and 4). The obligation on every Muslim to pursue one of the 'socially requisite' praiseworthy

sciences or vocations provides the means for every capable individual to live by earned income (Chapter 3). The *shari'a* democracy provides politico-legal equality which can be instrumental in achieving the egalitarian economic objectives (Chapter 5).

The concepts embodying the Islamic fiscal system are *zakāt, sadaqah,* and *infāq. Zakāt,* literally 'purity' and 'growth,' connotes in traditional Islamic literature the tax imposed on the surplus property of Muslims to be used for specific target beneficiaries. *Sadaqah* has meant voluntary social spending or charity.[70] *Infāq* literally means spending, private or public. The three terms are used interchangeably in the Quran. Many classical writers considered *zakāt* and *sadaqah* synonyms for both tax and charity.[71] We have adopted this Quranic viewpoint inasmuch as *zakāt* or *sadaqah* constitutes the total altruistic 'social spending' left over from personal income and wealth after deducting the 'personal spending' – houshold consumption and investment expenditures.

Criteria of social spending: public spending (taxation and beneficiary charges), and private spending (charity or philanthropy)

The call for social spending is, perhaps, the most reiterated social doctrine of the Quran. Some of its implicit aspects were discussed above. The basic principles of social spending pertinent to the general philosophy of fiscal planning and environmental engineering economics in particular are enumerated below. These principles pertain to taxation, including various forms of beneficiary charges, and private spending.

1 *Benefit and burden proportional for beneficiaries.* No duty (*taklīf*) is ever imposed without granting a corresponding right (*ḥaqq*), and vice versa. That is, benefits and burdens (costs) should be proportional. 'No bearer of burden shall bear another's burden.'[72] (cf. Chapter 4, *Majallah* Arts. 88, 87, 85).

2 *No mutual infliction of damage or external costs.* 'No damage and no mutual infliction of damage.'[73] That is, 'Wrong not and you shall not be wronged'[74] (cf. Chapter 4, *Majallah* Arts. 19, 20, 25, 31, etc.).

3 *The benefit of environmental resources should be available to all the creatures of God.* The state should organise the economy to provide equal opportunity for benefit to all the creatures of God: 'And there is no animal in the earth, nor a bird that flies on its two wings but (they are) communities (*umam,* nations, peoples) like you'.[75]

4 *Government should raise finances to provide general social welfare and economic growth.* 'Take *sadaqah* [taxes for public spending] out of their possessions that you may cleanse them thereby and cause them to grow.'[76]

5 *Social spending (especially tax expenditures) is a legal right of the poor and deprived.* 'In whose wealth there is a known right of those who ask and those who are deprived.'[77] The two categories of beneficiaries are subject to the widest possible interpretation. The

former might include those who cannot meet all their needs despite effort. The latter are deprived of earning an income, or adequate income, for causes such as physical and mental handicaps; pregnancy, child-caring, extreme youth or old age; forced unemployment; and preoccupation with socially beneficial work for which there might not be adequate or immediate economic reward such as learning and research by students, compulsory military service and social work for general welfare.

6 *Uni-directional flow of social spending from the rich to the poor.* The goal of fiscal planning should be the circulation of wealth 'so that it may not be taken by turns by the rich among you'.[78]

7 *Ability to pay as basis for minimum tax and beneficiary charges assessment.* 'No soul shall be burdened beyond its capacity.'[79] 'God imposes not on any soul a duty beyond its capacity.'[80] This defines the legal limit of minimum non-taxable income and wealth (*niṣāb*). None below this floor should be legally subject to direct or indirect taxation under normal circumstances. This does not forbid generous souls from private spending.

8 *Priority in satisfying merit wants of greater social importance.* Consciousness of relative social importance of wants must be inculcated among citizens so that they 'find in their breasts no need for that which has been given them, but prefer above themselves though poverty become their lot'[81] the more urgent social wants of other claimants to public expenditure. 'And whoso is saved from his own avarice . . . such are they who are successful.'[82]

9 *Surplus income and wealth as the basis for computing taxes, beneficiary charges, and private spending.* 'And they ask you as to what they should spend. Say the surplus (*'afwa*).'[83]

10 *Sacrificial level of social spending.* 'You cannot attain righteousness unless you spend out of what you love.'[84]

11 *The more the surplus, the higher the marginal rate of increase of social spending.* 'Do good [or be generous] as God has been good [generous] to you.'[85]

12 *Expending labour and capital resources to satisfy public wants is the reason for being of a Muslim.* 'Striving in the way of God with wealth and lives' means satisfying all 'public wants' as conceived in Islam: from wars for self-defence and the liberation of the oppressed,[86] to all conceivable peacetime activities to achieve the Islamic social welfare function which includes an egalitarian and economically developed nation and world.[87]

13 *Expending lives and labour for social causes in lieu of money.* 'Believers who cannot find anything' of cash value must contribute 'their hard labour' for social causes.[88]

14 *Policies consistent with the goal of egalitarian distribution of income and wealth should be adopted concerning economic stabilisation and*

allocation of resources. Given full employment and economic egalitarianism as the primary objectives of Islamic fiscal planning, other consistent fiscal policies should be adopted. In the allocation of resources, curbing propensities for conspicuous consumption; prohibition on resource allocation to wants whose satisfaction is un-Islamic or without social merit and achieving technological efficiencies (engineering and positive economics). In the stabilisation branch, taxing unproductive savings; conscription of savings for public and private investment for objectives determined through political decision-making on the principle of *sharika* with the saver, and so on.[89]

15 *Beneficiaries of social spending.*[90] 'Social spendings (*sadaqāt*) are only for the poor and the needy, and those employed to administer them, and those whose hearts are to be won over, and for the liberation of people from bondage, and those under burden of debt repayment, and [for every struggle] in God's cause, and for the wayfarers: [this] is an ordinance from God.'[91]

'And do good unto your parents and near of kin, and unto the orphans, and the needy, and the neighbour from amongst your own people, and the neighbour who is a stranger, and the friend by your side . . . and those under your protection rightfully.'[92]

'And in their wealth is a share for him who asks and him who is deprived.'[93]

'And men . . . and the women . . . who set apart for God a goodly loan, it will be doubled for them, and theirs is a generous reward.'[94]

The 'goodly loan to God' refers to interest-free loans and grants for development finance discussed above.

Social spending should also be for defence sufficient as a deterrent against aggression; but efforts should be made for disarmament and peaceful international relations so that 'if they incline to peace, you also incline to it, and trust in God.'[95]

16 *Motive and justification for social spending.* One should not contribute to public and private spending 'to be seen of men'[96] or 'consider it as a loss (*dawā'ir*, fine, burden),'[97] and follow it up 'with reproach and injury.'[98]

Social spending is in the best interests of the individual though he deludes himself through ignorance and short-sightedness,[99] and arrogant views of 'self-sufficiency'.[100] It builds a system of social security and frees the individual from the fear of helplessness[101] in case he is stricken with economic loss and leaves behind weak offspring.[102] Such collective action through social spending is a 'trade which will deliver you from a painful chastisement'[103] and 'self-destruction'[104] caused by economic underdevelopment, and economic inequality leading to mutual hatred, class conflicts and civil strife.[105]

Whatever is contributed for social spending is God's share for the

factors of production He bestowed upon individuals and nations. This is a central theme of the Quran. That is why an individual is entitled for his effort only to a *naṣāb* of the net total product: 'For men . . . and women is a portion of what they earn.'[106] The believer recognises that he is spending only that of which God made him an 'heir' and 'trustee.'[107] Social spending brings men 'nearness and mercy of God,'[108] and causes them to be 'cleansed and [to] grow'[109] by removing greed, selfishness and the obstacles to socio-economic stability and growth. It frees man from remorse on his death-bed that he was not a doer of good deeds,[110] and prepares him for the Day of Reckoning when there will be 'no bartering or befriending.'[111] Putting public welfare above short-sighted personal interests is the attribute of a man 'who sells himself to seek the pleasure of God'.[112] 'God has bought from the believers their persons and their property . . . theirs (in return) is the Garden [Paradise].'[113]

Thus Islam motivates people for social spending as a matter of ethical duty. It promises tangible socio-economic rewards in this life and psychic eschatological rewards in the life after death.

Fiscal planning and socio-political decision-making: the role of *sharī'a* democracy

Islamic democracy encompasses both the methods and contents of decision-making (Chapter 5). The contents comprise *sharī'a* legal, political, economic and other philosophies. The above outline of the Islamic economic welfare function is an attempt to delineate the *sharī'a* part of Islamic welfare economics. The *fiqh* economics, like *fiqh* law, is time-space bound, ephemeral, and subject to the methods and processes of decision-making of *sharī'a* democracy. Thus the precise legal definition of the 'surplus' or 'sacrifice' levels of taxation; the limit of disparity in income and wealth to be permitted in view of the *sharī'a* requirement of economic equality; and the exact domains of private and public sector economy, are all ephemeral socio-political decisions. These decisions will be made first through *ijtihād* and ultimately enacted into law through the legislative consultation-consensus (*shūrā-ijmā'*) processes. The judicial and administrative interpretations of fiscal and other economic policies are the later stages of increasing specificity.

The Quran does not fix the rate of *zakāt*, or *sadaqah*, taxes. The only rate of tax mentioned in the Quran is for spoils of war at twenty per cent.[114] According to the traditional Islamic system of taxation, the annual rates to be imposed are, for example: cash savings or hoards, gold and silver, two and a half per cent; agricultural produce from unirrigated land ten per cent; agricultural produce from irrigated land five per cent (allowing deductions for irrigation expenses); the produce of mines, twenty per cent.[115] The traditional books on taxation go into great details regarding the specific rates and taxability of various types of livestock kept for

breeding and trade, the different kinds of mines and their mineral and non-mineral products. These detailed views on taxation are partly traced to the views of the Prophet Muhammad, but are mostly the practices of the early Rightly Guided Caliphs, the *ijtihād* of the five eponymous founders of the principal classical schools of jurisprudence and their colleagues and the succeeding generations of their students.[116] Chapters 2 and 4 showed that the *ijtihād* and *ijmā* of one generation do not carry the weight of an authority nor become law unless they are implicitly accepted as *'ādah* or explicitly legislated through the communal and legislative consensus of later generations. The origin of these judgements was traced (Chapter 1) to the Quran: 'Those are a people who have passed away; for them is what they earned and for you what you earn; and you will not be asked of what they did'.[117] We also discussed, in the context of the Prophet Muhammad's judgements about *ḥarīm*, what should and should not be considered a 'legal, binding *Sunnah*' (Chapter 4). We argued after Ibn Khaldun (Chapter 3) that value-judgements and the unobservable aspects of reality constitute the *shar'iyya* sciences and the domain of the special insights of Prophets. The determination of rates of taxation falls within the purview of sociologically and technologically knowable universal rational sciences (Chapter 3). The determination of rates of taxation is a matter to be decided by ephemeral individual and social choices subject to *sharī'a* politico-legal methods and contents of decision-making (Chapters 2, 4 and 5).

The criteria of social spending through taxation and beneficiary charges employ the concepts of beneficiary payment, ability to pay, surplus, sacrifice and altruism. If every beneficiary must pay in proportion to his use of public goods and services, this could amount to a proportional system of taxation. Proportional taxation becomes Islamic if income and wealth are already distributed according to Islamic economic egalitarian criteria; this would be the treatment of equals as equals. However, in the existence of maldistribution of income and wealth under consistent patterns of ownership and management of sources or production and distribution, the Islamic criteria of social spending highlighting a progressive system of taxation should be invoked. This would make use of the concepts of surplus and sacrifice or altruistic humanism. This means that unequals cannot be treated as equals, and the marginal utility of income and disutility of taxes are not equal at all levels of personal wealth. The rates of progressive taxation would vary subjectively so that beyond certain levels of income and wealth there would be virtual confiscation. The floor and ceiling levels of income and wealth would vary also with the gross national product of the state. All these are socio-political decisions which must achieve the ultimate *sharī'a* economic welfare objectives like egalitarian redistribution of income and wealth. Therefore, treatment of the rates and types of taxes decided upon by the Prophet Muhammad as permanent values, or 'legal binding *Sunnah*', instead of as instrumental

values of the *fiqh* category would be against the letter and spirit of the *sharī'a*. This could defeat the ultimate objectives of *sharī'a* welfare economics, for example, earning by individual work and full employment and the redistributive objective.

The achievement of the subjective criteria of interpersonal economic welfare requires flexibility in invoking objective criteria. The objective criteria are always in conflict with each other due to competition among various social and merit wants for the limited available resources. The beneficiaries of social spending enumerated above in one Quranic verse are the poor, the needy, public administrators, those whose hearts are to be won over to Islam, men in bondage, debtors, those who work in the 'cause of God', and wayfarers. A second verse adds seven more classes of beneficiaries: parents, relatives, orphans, close neighbours, distant neighbours (that is, regional, national and international fellowmen), friends or allies, and dependents or protectorates. Other verses explicitly require spending on defence, those who ask for help, and those deprived (for example, of opportunities to work). This list of beneficiaries includes almost everybody in a healthy society except parasites and the *rentier* classes, indolent beggars and habitual dependents on public and private handouts. The way to help these beneficiaries is to provide employment opportunities for those able to work, and a system of social security and transfer payments consistent with human dignity for those who are incapacitated.

Let us consider some of the major classes of beneficiaries. For the 'wayfarers' we need a network of transportation facilities by various means of land, air, and sea; a communication network; a system for security of life and property which includes police protection and medical aid. Those who work in the 'cause of God' have been traditionally identified as those engaged in satisfying public wants, including social wants such as national defence and merit wants such as education and research. How do we reconcile the conflicts between more education and more defence, or intra-industry conflicts between road transport and other means of communication, and numerous inter-industry competitive objective criteria? Social spending for 'the poor' requires the entire gamut of economic development projects in the agricultural, industrial, and the physical and social infrastructure sectors. This becomes a problem of allocation of resources. Decisions will have to be made between objective criteria, for example, better food or better housing, better and more industrial products or a healthier environment; material goods and services or economic welfare or the non-economic desiderata of social welfare such as leisure and the development of the moral and artistic aspects of culture. Helping orphans and widows might require, in the context of demographic imbalance with the ratio of females to males exceeding unity, non-economic measures of social welfare in addition to the economic. As regards the former measures, Islam requires providing

a husband for a widow and a father for orphans through limited and regulated polygamy instead of promiscuity, concubinage and serial marriages for women; and 'big brothers' for orphans. Thus the choice between competing and conflicting objective criteria of welfare is subject to sociological, technological and subjective constraints. No *a priori* decisions can be made about them if our ultimate goal is the integrated social welfare of particular target beneficiaries. The *modus operandi* for the choice among objective criteria requires the axiological ranking of the set of objectives to be achieved (Chapter 1), or construction of objective functions with different arrays of strategies in an operation research context, and the exercise of choice through socio-political decision-making. The methodological instruments of choice are *istiṣlāḥ, istiḥsān, iḍṭirār* and *taysīr*. See Chapters 2 and 4.

The exact types and rates of taxes used by the Prophet Muhammad need not be applied in contemporary times for the reasons discussed in Chapter 4 regarding water law. A contemporary Muslim traditionalist concedes that it is 'unquestionably correct ... that finality and eternal validity may only be attributed to the Quranic Principles and Precepts,' and that the rates of *zakāt* have not been explicitly laid down in the Quran; nevertheless she 'faithfully' adheres to the rates of taxation laid down by the Prophet 'through conviction of the wisdom they embody.'[118] This is sheer scholasticism and casuistry, for this wisdom can be proved only if the application of these rates leads always and everywhere to full achievement of the terminal goals of *sharī'a* economic welfare function. This is further rendered impossible by the traditionalists because they look upon *zakāt* as limited in scope and function[119] even with regard to the distributive branch of the fiscal system. They would use *zakāt* funds for direct transfer payments to 'the poor' and 'the needy', to create a 'social security system' or 'socialism' of alms, and would impose taxes other than *zakāt* to run the state, undertake economic development projects, and carry out other activities in the resource allocation and economic stabilisation branches of the fiscal system. Our discussions above showed that this scheme would be contrary to the letter and spirit of the Quran and reason. The Quran presents a unified system of taxation and social spending. As admitted by classical Islamic jurist-economists, the terms *zakāt, sadaqah* and *infāq* used in the Quran are synonymous. There is no Quranic economics of taxation and social spending other than in terms of the above concepts as presented here. Deprived of any basis in *sharī'a* principles, the traditionalist must succumb to pure reason or secularism. Furthermore, logically and practically it is impossible to treat as water-tight compartments the three branches of fiscal planning – resource allocation, economic stabilisation, and income and wealth distribution. All three branches affect the distributive objective which is the main focus of the Quranic economics of taxation and social spending. In a smoothly running Islamic economic system, the redistribution function

through progressive taxation would wither away, leaving it the task of merely maintaining the egalitarian economic system with proportional taxation. To achieve and maintain such an egalitarian system, except for minor direct transfer payments mainly to those mentally and physically deprived of the capacity to earn, the main heads of expenditure of *zakāt* or *sadaqah* or *infāq* tax revenues would be in the resource allocation and stabilisation branches. This would be consistent with the multiple goals of the Islamic economic system: spending on all the beneficiaries enumerated in the Quran by maintaining full employment and enabling everybody to acquire earned income and wealth in a manner that preserves human dignity. These arguments further erode the traditionalist claims that the Prophet Muhammad's sayings and practice (*Sunnah*), regarding details of economics of taxation are 'legal, binding *Sunnah*' or as authoritative and binding for all times as the principles of the Quran. These Muslim traditionalist anomalies and contradictions of the *sharī'a*, particularly the Quran, can be removed by restoring the authority of *ijtihād* and *ijmā'*. These *sharī'a* sources of decision-making must be employed to devise, and keep under constant review, a comprehensive contemporary economics of taxation based on the *sharī'a* economic welfare function.

The above arguments for flexibility in the choice of Islamic objective criteria of welfare economics and their subjective application, and the reinterpretation of basic *sharī'a* principles and their authentication by continuous *shūrā-ijmā'* legislative methods of decision-making, seek only to deny the claim of tradition as authority. These arguments do not, and should not, deny the *value* of traditional Muslim economic thought for now and the future. The *Sunnah* (traditions) of the Prophet Muhammad do not lose their exemplary value as case studies of the *sharī'a* economic welfare function. Sociological and technological changes can only erode their authority as 'legal, binding *Sunnah*'. Considering the entire corpus of traditional or historical Muslim economic thought, the historian of the economic thought of mankind would find that in this branch of the socio-cultural system, as in many others such as science (Chapter 7) and law and politics, the medieval Muslims accomplished much of the mission of mankind. They interpreted basic Quranic principles of economics which civilised mankind recognises as the principles of an equitable economic system. We enumerate below a few such principles of taxation derived from the three earliest extant works on taxation by Abu Yusuf (d. AH 182/AD 798), Yahya b. Adam (d. AH 203/AD 818), and Quadama b. Ja'far (d. AH 320/AD 932).[120]

1 The Islamic state has the right to increase or reduce taxes.
2 Rates of taxation are fixed in accordance with the status of the taxpayer, and should not exceed his ability to pay.
3 Taxes are levied once a year.
4 A minimum income is free from tax.

5 Business expenses are deducted when assessing taxes.
6 Debts are deducted when assessing taxes.
7 Exempt from taxes are:
(a) Crops damaged by floods, etc.
(b) In certain cases women, minors, dependents, invalids, and non-Muslim priests and monks.
8 Tax evasion is a fraud.
9 Private spending (that is, charity which is over and above the legally payable taxes), is not legally compulsory.
10 Foreigners are taxed on a reciprocal basis.

The Islamic criteria of social spending employ objective criteria of economic welfare such as freedom from bondage, and employment in socially beneficial production and distribution processes which are socio-political means and conditions of social welfare. These criteria require satisfaction of definite human wants such as food, clothing, shelter, leisure, education and training. Education is geared towards meeting socio-economic material wants as well as moulding wants and desires through disciplinary and motivational institutions such as prayer, fasting, pilgrimage to Mecca, and social spending (*zakāt* or *sadaqah*) itself. These objective criteria and their interpersonal comparisons of welfare require the measurement of needs, benefits, surplus and sacrifice, in terms of measurable and quantifiable desiderata of economic welfare. Traditional Islamic economic thought measured these desiderata as the number of cattle, measures of grains, weights of gold and silver, and amount of capital. This is in contradiction to that naive utilitarian ethic which seeks to measure, for purposes of taxation and interpersonal comparisons of welfare, surplus and sacrifice in psychological magnitudes of total and marginal 'utility'.[121] Thus Islamic economic welfare criteria are positivist, and decisions are based on socio-political ethical judgements. Islamic welfare economics does not drift towards a 'science of measurement of the psychic magnitudes of utility'. Due to the Quranic proscription against meddling with the 'unseen' *al-ghayb* (Chapter 1), Muslim epistemology rejected speculative or dialectical metaphysics and the 'philosophy' science which formed a part of classical Greek philosophy (Chapter 3). Modern Islamic welfare economics must reaffirm and build upon its medieval heritage of the Islamic ethic as the criterion for value-judgements in economics, and make contemporary *ijtihād, shūrā,* and *ijmā'* the principles and processes of decision-making. These processes and *sharī'a* principles of welfare economics must be the basis for decisions, constantly under review, on the specific issues of economic policy. These issues concern controlling prices, wages, profits, and environmental quality; market regulation in general and particular cases when nationalisation of environmental resources may take place with or without compensation. This has also been discussed above in the section on 'ownership and enterprise: public *vs* private sector.'

Implications of Islamic economic welfare function for fiscal planning of environmental resources development[122]

At the outset it is important to recall the *sharī'a* principle on unity and hierarchy of means and ends (Chapter 5). This principle of 'means' (*dharī'a*) states that those means are themselves obligatory which lead to or promote an obligatory goal, unless those means are *a priori* unlawful. Any lawful means become unlawful if they lead to forbidden ends or consequences. Thus environmental resources development is an obligatory means to achieve Islamic social welfare.

The objectives of public finance policy must be to use fiscal instruments to further the goals of the Islamic economic welfare function with regard to economic stabilisation, allocation of resources and distribution of income and wealth. These three branches are interdependent but are discussed here separately for convenience.

Allocation of resources

The basic task of allocation is to choose among alternative uses of resources to satisfy the economic desiderata of welfare in the proper hierarchy. Since the objective criteria of economic welfare are a healthy environment, food, shelter, sanitation, public utilities, and recreation, environmental engineering systems planning must provide all people with the means to achieve them. Thus provision of food requires the development, management and conservation of soil and water resources, and other ancillary institutions; and shelter requires rural and urban housing and town and city planning.

When there is a divergence between private and social products, the market mechanism fails to allocate resources, and the budget should provide for these goods and services. This is the case with social wants, for example, a flood control project or transportation system. The extent to which social wants must be satisfied and resources released are not revealed by the market. This calls for socio-political decision-making. The way the cost should be spread in the society affects both resource allocation and income distribution. If income elasticity of social wants is small, the taxes required to cover the cost of such public services would be regressive, which is not allowed by the Islamic distributive objective. The proper incidence of costs and beneficiaries of environmental projects are discussed below.

Resource allocation is subject to consumer sovereignty and consumer effective demand. These are determined by individual preferences and the prevailing state of income distribution. Islamic welfare economics requires large scale interference in resource allocation since it wants to direct and regulate individual preferences, effective demand, and the state of distribution. This was apparent from our discussion of the methods of acquiring income and wealth. The Islamic objective criteria of

economic welfare require satisfaction of such wants as housing and a transportation system. All these become merit wants. Under given budgetary constraints, providing housing for all people would require controlling and regulating residential construction so that extremes of luxury homes and slums and squatter settlements would be illegal. This would require diverting resources to build apartments which all the people can have even if this means constructing only single-room tenements with all other facilities shared by more than one family. Similarly resources would be withheld from satisfaction of other than public and merit wants which would be considered *a priori* 'unmeritorious' or blameworthy wants (for example, building luxury hotels or casinos). This also defines an Islamic concept of efficiency in resource allocation. Such an allocation of resources is consistent with the basic tenets of Islamic economic welfare function such as mutual aid, universal human brotherhood, equality and economic trusteeship. This also enhances the cause of human freedom. The would-be dweller in a luxury apartment is freed from greed while the would-be dweller in the street or slum is freed from human indignity and granted freedom from heat, cold and lack of privacy.

The satisfaction of such public and merit wants is possible under different production, distribution and ownership patterns. All goods could be produced by the government or privately such as the tenements in the above example. These tenements could be sold on the market at controlled prices to private owners, or purchased by the government and distributed at a user charge (rent).

Economic stabilisation

The function of stabilisation is to maintain a stable value of money and a high level of resource utilisation. The latter should mean full or 100 per cent employment. This employment requirement is a direct consequence of our discussion on acquiring income and wealth through individual effort by lawful means. The Islamic state must guarantee work to every person through institutional arrangements which we need not discuss here. Muslim, and non-Muslim, economists have argued that zero interest rate ensures or contributes towards lack of cyclical fluctuations in business and industrial production by discouraging idle hoards since they are subject to *zakāt* or *sadaqah* tax; making savings equal investment; removing the impediments on investment by lowering the marginal cost of capital, and maintaining a high aggregate demand.[123]

The Islamic economic welfare function puts additional constraints on the usual stabilisation policies adopted in a free enterprise system. These constraints would make the Islamic economy better planned and controlled. The most important constraints are that a 100 per cent employment rate must always be maintained, and the *sharī'a* allocation and income distribution objectives and goals should not be violated. For example, the remedies to halt inflation by reducing the level of expenditures are to

reduce government expenditure, increase taxes and reduce transfer payments. An example of adopting these three measures without violating the Islamic constraints of full employment and egalitarian distribution would be the elimination of an environmental resource project near the bottom of the list of priorities and the transfer of the men employed on it to another project. The reduction in aggregate demand and spending can be accomplished through forced or voluntary savings by purchase of government certificates, by increasing taxes on profits and wages and reducing transfer payments in a way that does not affect the egalitarian distribution of income and wealth.

Distribution of income

Without an Islamically acceptable egalitarian distribution of income and wealth, the resulting pattern of effective demand for the use of resources cannot be accepted as efficient in the qualitative sense. Conversely, individual and aggregate demands and the allocation of resources should also be so controlled and directed as to lead to permissible distribution patterns. Corrections in distribution patterns can be brought about through state ownership of environmental resources and enterprises which give large profits for any reason to an individual, as well as through tax and transfer (social spending) systems. The method of financing public utilities or environmental development projects, and deliberate interference in the market processes such as manipulation of market structure and the pricing of utilities and public goods can also affect distribution patterns. Islamic laws of inheritance are designed with a redistributive objective. These and other factors should be used to achieve the Islamic economic equality objective decided upon through the socio-political process.

If the taxes or prices levied in the allocation branch for satisfaction of social and merit wants were zero, that is, these goods and services were free, there is a strong likelihood of their inefficient consumption and over-production. This would cause misallocation of resources and damage public interest. Therefore, there is a strong case for proportional taxation in the allocation branch. The tax of user and beneficiary charges may be, wherever possible, in proportion to the benefit derived and effective demand for such public utilities. The maldistribution of income introduced by this might then be corrected through tax-transfer method of social spending under the distributive objective.

Implications of Islamic welfare economics for environmental engineering systems planning

One of the characteristics of sensate economic systems is their relative neglect of income distributive effect of projects, and the greater emphasis on the mechanics and arithmetic of economic evaluation of environmen-

tal projects such as allocation of the costs of a multiple purpose project according to its functional purposes, for example, flood protection, irrigation and power generation.[124] However, the incidence of costs and benefits for the ethical purpose of egalitarian income distribution among people is the most important economic aspect of projects for the Islamic welfare function. There is, therefore, a presumption in favour of the form of financing public projects which assigns benefits to individuals and groups with lower income and wealth at the expense of those who are comparatively richer. The difficulties in discriminating among beneficiaries who should be charged for public goods used by them and the possibilities that the costs of administering such user charges might exceed the revenues that could be collected, are problems which are not discussed here. Some methods of financing and pricing public utilities and environmental resources projects in general are discussed, in the context of Islamic welfare economics and particularly its criteria for social spending or tax-transfers.

Financing and pricing public projects and utilities[125]

The following methods of financing and pricing public projects and public utilities may be considered:

1 *Subsidy from national funds.* This might be accomplished by increasing the national taxation. If this taxation is on net personal assets (income and wealth) subject to increasing marginal rates, according to the Islamic concepts of surplus and sacrifice; it would not distort the egalitarian distribution goal. Raising national funds through discriminatory indirect taxes on consumption of non-essential commodities used by the richer classes (within the limits of permissible inequality), also may not be objectionable. This method of financing permits charging a price equal to marginal cost, and enables the undertaking of an investment which otherwise might not be undertaken. While this method of financing may not prevent investment being expanded to the ideal output level, it is possible that the output might be expanded to excessive levels. Any national or local level project can be financed by this method which assures that the target beneficiaries will not be taxed and the redistribution objective can be achieved.

2 *Two-part tariff.* According to this method the consumer pays a fixed annual amount for use of the facility, and the marginal cost for each unit supplied. This is a beneficiary repayment method, with payments being proportional to the benefit derived. It is suitable when an equitable distribution of income and wealth already exists and interpersonal comparisons of ability to pay are unnecessary. The method provides a disincentive against excessive investment in the public utility or environmental resource project, and its excessive use. However, it excludes completely those who are not willing to pay more

than the marginal cost of the service, and those who are not able to pay at all.

3 *Average cost pricing.* In an industry with decreasing marginal cost of production, this method of pricing is equivalent to charging an indirect tax on the service in addition to the marginal cost. This method of financing is similar to the two-part tariff as a method of taxation. Since the price exceeds the marginal cost, the utilised output would be less than the ideal. It has more disincentive than the other methods of finance against excessive investment.

4 *Price discrimination.* This is a variant of the previous method. It provides marginal cost pricing plus a tax on consumption at different rates for different classes of consumers. Where discrimination is possible, such as in transportation (for example, roads and bridges charging a toll according to the kind of vehicle and utilised capacity of the vehicle), and electricity charges, different rates can be found that will bring the output closer to the ideal than would be the case with single-pricing. The criteria of discrimination on the basis of one's net assets would make this pricing method a progressive form of taxation.

Of these four methods of financing environmental resources projects, the first is most consistent with the Islamic criteria of income redistribution. This method may be applied in the case of public goods and certain merit wants which may be provided free of charge, for example, highways, recreational parks and family planning facilities. However, public utilities such as water supply and electricity may be financed through a variant of the price discrimination method. While disparities in income exist in the short run above the permissible level, the price charged may reflect the same pattern as the tax on net assets, with lower incomes being exempt from payment of the charges as long as their consumption of the services is not beyond certain ceilings. The output levels of the utilities might be regulated to conform with ideal levels such as in the case of discharge or emission of pollutants that cause damage to the human environment and ecological balance.[126]

Conclusions

The prohibition of all forms of beggary and unearned income, and the requirement that all able-bodied men and women should earn their livelihood by performing any work that is individually or socially requisite and beneficial, imply a planned economy with no unemployment. The vicegerency of man on earth implies an optimum utilisation of all geophysical forces and resources. Since all animals of the biosphere are considered in the Quran *umam* like the children of Adam, and God has 'ordained in earth food equally for all seekers,'[127] men must recognise the right of all the creatures of God to environmental resources. Environmental disruption of any kind must be avoided, first, as an ethical

command of the *sharī'a* and, second, to protect public interest and the universal common good of all mankind and other 'peoples' of God.

The definition of economic welfare in terms of objective criteria such as food, shelter, public utilities, transportation and a healthy environment for men and other creatures, determines the importance of environmental resources planning in the Islamic culture. Along with the criteria of social welfare, such as defence and the moral education and upliftment of people, the criteria of economic welfare determine the goals and direction of resource allocation in Islamic fiscal planning. Combining economic and social welfare objective criteria with the economic egalitarian ethos of Islamic distributive function, an Islamic universal social or communal (socialistic or communistic) goal-orientation of the economy becomes inevitable. The terms socialistic or communistic should be understood from the unique Islamic perspective rather than in terms of Marxist-Leninist political economy (cf. Chapter 5). When, where, and to what extent such a goal orientation requires a free enterprise, nationalised, or mixed economy type of institutional orientation is largely a matter of rational choice of strategies through the socio-political decision-making methods of the Islamic or *sharī'a* democracy. However, there can be no doubt whatsoever that all the people without distinction of ideological or material socio-cultural differences must be provided more or less equally with the desiderata of objective econonic welfare. The floor levels of these desiderata should ultimately depend on the total production of goods and services in the world economy, and the upper levels should reflect the limitations of environmental resources and ecological balance of the biosphere.

7 Imitative-innovative patterns of socio-cultural rejuvenation: Islamic ideological and technological modernisations[1]

Introduction

This chapter presents historical examples and fundamental principles of socio-cultural rejuvenation through imitation and innovation. This will summarise the preceding chapters and give a generalised theory of rejuvenation of the Islamic socio-cultural system. Environmental engineering systems are a specialised subsystem of the whole socio-cultural system. The historical examples given here are necessary to establish the fact, scope, and limitation of imitation and innovation, and to explain the meaning of modernisation in the context of medieval and modern Muslim-Western cultural interpenetrations.

The West refers to medieval non-Muslim Europe, and in the modern context includes the Western Hemisphere in general. A distinction is made between Islamicisation and Islamisation. The imitative-innovative assimilation of Islamic culture by non-Muslims is Islamicisation. This is similar to Westernisation. The adoption of ideal Islamic culture by Muslims in their behavioural culture is Islamisation.

Historically, the West has generally maintained a conspiracy of silence regarding its medieval rejuvenation through Islamicisation. In more recent times a large number of Western scholars, together with Muslim scholars writing in Western languages, have been bringing out the diffusion of Islamic science, philosophy, and other aspects of culture in the medieval West. However, such researchers have not been incorporated in the Western education system and culture, in the manner and to the extent necessary for fostering the proper appreciation of the ideal and historical patterns of Islamic culture. Therefore, emphasising the fact of the backward state of contemporary Muslim behavioural culture patterns, and denying the existence or validity of ideal Islamic culture patterns, the West portends and strives for Westernisation of the Muslim world. The same, of course, is true of Marxist-Leninist self-views, polemics against Islam, and the efforts to impose Marxism-Leninism on the Muslims after their demoralisation through character assassination of the Islamic culture. The reactionary Muslim responses through polemics, xenophobia, historical romanticism, zealotism, and Herodianism, are a far cry from the creative adaptation indispensable for contemporary

rejuvenation. Furthermore, there is a tendency among the *ijtihādiyya* Muslims, who emphasise independent reasoning, to indiscriminately equate imitation with the *sharī'a*-condemned *taqlīd maḥḍ*. On the other hand, the orthodox or conservative Muslims tend to equate all innovations with the *sharī'a*-blameworthy innovations and even heresy. While there should be no doubt that all heresies are unlawful, a distinction must be made between a good innovation (*bid'a ḥasana*) and a bad innovation (*bid'a sayyi'a* or *bid'a khābitha*) through application of *sharī'a* and sociologically praiseworthy criteria (Chapter 3). This chapter supplements the ideas and methodology used in the preceding chapters with historical examples, and incorporates them all into a generalised sociological theory for programmatic application for Islamic ideological and technological modernisations.

In the previous chapters we have referred to imitation and innovation under various other names. Thus diffusion, transfer, transmission, borrowing, absorption, adaptation, assimilation, and mimesis connote social imitation. Discovery, invention, creativity and originality, connote innovation. Though some sociologists would like to make fine distinctions between various terms signifying imitation and innovation, we are treating the terms in each group as conceptually identical. Unless otherwise stated, innovation stands for good innovation. *Ijtihād* and *ijmā'* are basically innovative processes for a deliberate choice among alternatives for imitation renders such a decision innovative.

Chapter 1 elaborated the Quranic postulate of a succession of Prophets inspired by God to transmit the basically same message of primordial Islam, and also the fact of some ideological and institutional innovations in the Quran. Chapter 2 summarised some of the sources of the *sharī'a* and *fiqh*. We concluded that the basic mission of Islam was to formalise the principles and methods for intra-cultural and cross-cultural borrowing and assimilation either through:

1 reform and adaptation;

2 enlightened imitation with some or no change in what was borrowed;

3 innovations on the bases of God's revelation of His will in the Quran, nature, and history.

Chapter 3 discussed the sources, conditions and criteria for development of Islamic systems of knowledge and education through imitations and innovations in the *sharī'a*-susceptive and universal-rational realms of the disciplines comprising environmental engineering systems. We also advocated the transmission of ideological and technological sciences through translations, and teaching the imitative-innovative processes through Islamic philosophy and sociology of science based particularly on the genuine history of medieval science. Chapter 4 gave concrete examples of the scope and limitations of imitation and innovation in water resources engineering systems in general, and water law in particular.

Chapter 5 followed the same strategy of development, calling for adaptation of modern Western and Communist forms of organisations and political institutions. Marginal variations might be made in them in the process of adaptation, but we must superimpose on them the characteristic attitudinal responses, principles of decision-making, and the concepts of planning and human welfare based on the ideals of the Islamic state and political culture. Chapter 6 implied that positive economics of non-Muslim origin is subject to assimilation on the basis of sociological criteria for praiseworthy sciences (Chapter 3).

Positive economics then becomes an instrument of Islamic welfare economics principles and criteria. Islamic welfare economics might have points of contact with Western or Marxist welfare economics. Methodologically, our strategy was to make an axiological systematisation of Islam – identifying its intrinsic and instrumental values – and to adopt ephemeral instrumentalities and technologies, regardless of their source but not independent of Islamic values, to achieve Islamic values and goals. We invoked the authority of Islamic dogma, the principles of revelations of God's will; and Islamic law, the principles and methods of the *sharī'a*. We here derive sociological principles of socio-cultural rejuvenation on the basis of historical evidence. This will highlight, first, the nature and areas of cross-cultural borrowings by Muslims from contemporary developed socio-cultural systems. Without this, Islam would only be an ideology, not an empirical system. Second, the historical study will incorporate data on medieval Western-Christian rejuvenation through borrowings from the Islamic socio-cultural system. This will not only explode the myths built by Western egocentric cultural illusions; it will also curtail Muslim apologetism, historical romanticism, and xenophobia by bringing out the proper role of imitative-innovative processes in the rejuvenation of historical civilisations. This is important in order to accelerate the development of backward nations since shy borrowers and arrogant donors do not provide an atmosphere favourable for imitative-innovative processes – the *élan vital* for socio-cultural rejuvenation.

Basic patterns of culture: the ideal and model, and the actual or behavioural

The distinction between the ideal patterns of culture and the actual or behavioural patterns of culture is recognised as basic in social sciences.[2] In ethics, being is of two kinds, the ideal and the actual.[3] There are three components of an empirical socio-cultural system (civilization, according to Arnold J. Toynbee):

1 the 'system of meanings' – ideals, values, norms;
2 a causal 'system of vehicles' – empirical means and instrumentalities;
3 the 'human agents' of the system who are its living bearers.[4]

Ideals, like engineering specifications and standards; are extremely important for goal-orientation. Ideals are materialised through the efforts of their human agents by adoption of vehicles and instrumentalities. The realm of the actual is malleable and dirigible, perfectable or corruptible. Actual cultural patterns are at best an approximation of, at worst a negation of and deviation from ideals. Man is susceptible to the appeal of ideals, and is under command to mould the actual in the image of the ideal. Affirmation of the existence of ideals distinguishes the islamic system from moral nihilism and cynicism. Technological development is impossible without a striving for knowledge of ideals and their implementation.

Ideals exist at different levels of abstraction, for example, the primary and secondary system of meanings such as *sharī'a* and *fiqh*. The actual exists at different levels of goal-achievement. A model cultural pattern is a relatively perfect empirical realisation of the ideal. A model might be an empirical vehicle or an exemplary human personality. The ideal, model and actual cultural patterns should not be confused with one another. These cultural patterns should be compared cross-culturally at the same levels of being.

Cultural relativism: an appreciation of alien cultural patterns

Cultural relativism is adoption of 'the perspective of the adherents of a given culture' as 'understood and . . . valued only according to the way the people who carry that culture see things.'[5] It would be a reversion of values to adjudge an ideal cultural pattern by a behavioural if the latter is at best an approximation of the ideal.

In case of interpenetration of two cultures, when conditions for diffusionism are satisfied, their relations could be perceived in terms of a challenger and a defender, a donor and a borrower, an ideal or model and an imitator. We must investigate whether each culture is stimulating the other to pursue the indigenous or exogenous ideal and model patterns; and the mechanisms, direction and extent of mutual cultural exchanges. The first order of business would then be establishing correlations between the ideal and model patterns of the two cultures. The equivalence or similarity in characteristics of the pattern variables of the ideal and model cultures might prove multiple origins of those characteristics rather than support overt borrowing claimed by ethnocentric illusions. This line of reasoning becomes further complicated in the case of Islamic and, on the other hand, Western and Marxist-Leninist cultures. (The Marxist-Leninist culture in our context refers to Eastern Europe and the USSR.) This is due to the Islamic postulate of multiple origins of truth whose author is God but the human agents of the divinely revealed primary 'system of meanings' were the Prophets (Chapter 1). The epistemological *raison d'être* of congruity in the universal rational realm of knowledge and culture is the rational nature of all men without distinctions (Chapter 3).

Where they exist the similarities in the Islamic and Western-Christian, also the Eastern-Communist, ideal and model cultural patterns, also have historical-sociological bases. In Chapter 3 we alluded to the genesis and growth of medieval Islamic and Western-Christian sciences and cultures, not *ex nihilo*, but through mediation of the mechanisms of diffusion. This does not deny the distinct characteristics of Islamic and Western-Christian medieval or modern civilisations, or the fact that medieval Muslims and other peoples were creators and innovators.

Political modernisation: Islamisation or Westernisation?

Parsons[6] described role-definition in socio-political systems in terms of three pairs of 'pattern variables': universalism *vs* particularism, achievement *vs* ascription, and specificity *vs* diffuseness. Universalism connotes value-orientation towards universally valid canons such as those used in recruitment for bureaucratic organisations through impersonal criteria pertinent to effectiveness for achievement in that role. Particularism has an emotional orientation such as recruitment of a kinsman or friend because of his membership in a solidarity group. Achievement orientation stresses the actor's own performance; his differential treatment, role expectations and status are based on expected goals achieved. Ascription-oriented roles place the accent on the actor's qualities or attributes independent of his performance. Specificity is characterised by interest-segregated orientations wherein role expectations are functionally differentiated into specialised norms and structures such as legislative, administrative and judicial roles; bureaucracies; and political parties. Diffuseness connotes a lack of functional specialisation, different roles being performed by the same functionaries.

These universalism-achievement-specificity and particularism-ascription-diffuseness variables are specifications of Weber's general concepts of 'rationality' and 'traditionality.' Based on these pattern variables, Sutton and Riggs developed models of industrial and agricultural political systems, the 'industria' and the 'agraria.' Almond contends that all societies, 'modern' and 'traditional' or 'primitive,' are characterised by 'structural dualism' since both primary (that is familial and kinship) and secondary (that is bureaucratic and impersonal) structures and relationships coexist. The Western or 'modern' parliamentarian has stronger loyalties to formal parliamentary norms than to his primary groups. Formal structures like legislative committees or party factions based on interest or regional groups are more effective than primary structures, and penetrate, domesticate or 'modernise,' these structures. The formal structures of a non-Western or 'traditional' legislature are based on extended aristocratic family ties, caste and religious sects; these primary groups constitute the real decision-making parliamentary structure instead of the formal committees or party factions.[7]

According to these views, Western is synonymous with 'modernity,' 'rationality,' 'industria,' and universalism-achievement-specificity. The

non-Western is equivalent to 'traditionality,' 'agraria,' 'primitiveness,' and particularism-ascription-diffuseness. This might be a true picture of behavioural culture patterns. However, to contend that the striving for political and bureaucratic rationality, modernity, industrialisation, and universalism-achievement-specificity connote Westernisation (or secularisation) would be a cultural monist and ethnocentric view. Arnold J. Toynbee would call it Western 'egocentric illusion,'[8] for it arbitrarily denies ideal and model patterns in the 'non-Western' cultures.

The pattern variables of Parsons and other characteristics subsumed in Western concepts of 'modernity' and 'rationality' belong generically to Islamic ideal and model socio-political culture. These characteristics were discussed in general terms as Islamic ethic (Chapter 1); as individually requisite values to be indoctrinated through education and religious institutional acculturation to inculcate creative altruism or humanism instead of acquisitive pragmatism among professional elites (Chapter 3); and as specific qualities relevant in political socialisation and the recruitment of public officers including the caliph (Chapter 5). The goal of these ideals is transformation of actual Muslim particularistic-ascriptive propensities expressed by the concept of socio-political *'aṣabiyya*, in the pejorative sense. The life and times of the Prophet Muhammad and the Rightly Guided Caliphs are best known for the classical fulfilment of Quranic universalistic-achievement ideals.[9] The formal structures of Western modernity and democracy based on regional or interest groups will not be looked upon as universalistic-achievement according to the absolute-value orientation of Islam which requires the community of values and justice to subordinate such interest-oriented *'aṣabiyyas* (Chapter 5). The specificity-diffuseness variable of Parsons is perhaps more descriptive of the universal rational technological culture, connoting the variety and multiplicity of socio-cultural empirical vehicles and institutions, and the quantitative growth and qualitative diversity of human agents (that is functional specialisation). This was discussed also by Ibn̄ Khaldun in his sociology of *badāwa* ('rural,' 'primitive') and *ḥaḍāra* ('urban,' 'civilised') cultures. The *badāwa* cultures have primitive or underdeveloped industries, methods of production and economic life. *Badāwa* political institutions are not amenable to regimentation and hierarchical subordination. The *ḥaḍāra* cultures are characterised by highly sophisticated sciences and technical skills; diversified production and the consumption of luxuries; urbanisation and public works; and market economy and taxation. These *ḥaḍāra* characteristics are brought about by and coexist with compatible developed political institutions. Thus the qualitative shift in the locus of solidarity from *badāwa* to *ḥaḍāra* designates the greater communal ethos or solidarity (*'aṣabiyya kubrā*): the change from kinship to tribal solidarity, to solidarity of a whole people, to solidarity based on religion, ideology and law, and among urban groups.[10]

The above discussion shows that the Western notions of modernity and

traditionality have their Islamic counterparts. Islamic political modernity could also be described in terms of universalism-achievement-specificity. However, the meanings of these pairs of pattern variables are similar in some ways but different in others in the Islamic and Western political philosophies. We also found the same fact in the different meanings of democracy, public interest, methods and contents of decision-making, in Chapter 5. The insistence on one set of meanings for these ideals and pattern variables betrays ethnocentrism, and egocentric illusion, and a denial of cultural relativist premises. It overlooks the fact that social reality fluctuates between ideal, model, and actual cultural patterns. Such fluctuations occur in all civilisations during their life covering hundreds and thousands of years. At any point in history, a subsystem like science and technology might be more developed in an empirical socio-cultural system than other subsystems like music or religious pietism, in absolute terms and in comparison with the level of achievement in alien or indigenous ideal and actual cultures. This another aspect of Sorokin's discussion of fluctuations of empirical socio-cultural systems among various phases of ideational, idealistic and sensate culture mentalities; or Ibn Khaldun's characterisation of rhythms of states and cultures among *sharī'a*, rational and arbitrary forms.[11]

Basic patterns of socio-cultural rejuvenation through imitation and innovation

The contemporary reconstruction of the Islamic socio-cultural system requires an optimum blend of *taqlīd* and *ijtihād*. Such imitation-innovation processes are the strategy followed by all historical civilisations which have succeeded in their efforts to rejuvenate; including the post-Quranic Islamic as well as the medieval Western Catholic-Protestant Reformation and Renaissance.

Imitation-innovation processes in rejuvenation of early post-Quranic Islamic culture

The scope and limitations of imitation and innovation were dealt with more extensively in the first three chapters. We also alluded to the role of translations into Arabic during the second half of the second-eighth and the third/ninth centuries in transmission of pre-Quranic science and learning to the Muslim and non-Muslim Arabic scholars. Western historians and sociologists of culture have, by and large, adhered to racist, evolutionist and ethnocentric theories; their recognition of diffusionism is very recent.[12] Due to the explicit Quranic assertions and the principle of succession of Prophets (Chapter 1), and the example (*Sunnah*) of the Prophet Muhammad which includes deliberate borrowings from the traditions attributed to earlier Prophets (Chapters 2 and 4), Muslim scholars have always affirmed the necessity and value of enlightened

borrowing, intra-Muslim and cross-culturally.[13] We discussed this in some detail after al-Ghazali who emphasised the *sharī'a* and sociological grounds for borrowing the praiseworthy sciences even from the fraudulent philosophers (Chapter 3).

The advent of every Prophet, and the revelation of the Quran, marked successive rejuvenation of the pure ideals of primordial Islam. In every age the transformation of these ideals into an empirical socio-cultural system of Islam required selective imitation of the existing ideological culture, but a more thoroughgoing imitation of the material or technological culture. Thus adaptation of a given material culture is indispensable in the short run during socio-cultural transformations, the human agents being more rapidly and thoroughly transformable into a new personality type bearing new ideals.

After the revelation of the Quran, the Arab material cultural system of language was the same, Arabic; even the pre-Quranic word for the Supreme Deity among the hundreds of smaller gods of the pagan Arabs, *Allāh*, was retained[14] but given new meanings according to the Islamic concept of God. The material, techniques and technology of warfare remained the same; the modernised military technique of using trenches introduced in Arabia in the times of the Prophet Muhammed was an imitation of a Persian innovation.[15]

Caliph 'Umar adopted without change the Islamically consistent land revenue assessment and collection systems of Iran and Syria and adopted after reform the corresponding systems of Egypt, but he abolished serfdom in Syria and Egypt to make the tillers owners of their land as required by Islam. He retained Persian, Latin, and Coptic as languages of administration, and the Zoroastrian, Greek and Coptic administrators in Iraq and Iran, Syria, and Egypt respectively.[16]

Islamic philosophers of the Mu'tazilah school from the second/eighth to Ibn Taimiyyah in the early eighth/fourteenth centuries led the revolt against certain aspects of classical Greek philosophy such as Aristotelian logic, physics and metaphysics. But the Muslims also assimilated what was consistent in Greek philosophy and science with the primary values of Islamic ideological culture. This triumph of Islamic culture over classical Greek philosophy brought about the advent of modernity.[17]

Similarly, the Muslims selectively assimilated the pre-Quranic heritage of technological culture. The earliest Greek works done into Arabic were in one of the practical sciences, medicine. The Muslims selectively adapted Greek, Pahlavi and Sanskrit medical works, and made new inventions and discoveries. Then for over six centuries in the West, and even longer in the Muslim world, the *Canon of Medicine* of Ibn Sina, the *Continens* of Ibn Zakariyya al-Razi, and the *Surgery* of Abul-Qasim al-Zahrawi remained supreme as medical text books.[18] But Abul-Qasim's *Surgery*, for example, was 'based upon Paulos Aegineta,' the Alexandrian who flourished in early first/seventh century; and Aeginetas' work was

'based upon Galen and Oribasios' of antiquity.[19] Despite the breakthroughs achieved by Muslim medicine through application of the experimental method, this only proves that scientific discoveries and inventions do not take place *ex nihilo* but through diffusion and the imitative-innovative processes. Men of science and learning stand on one another's shoulders. The scientific and idealistic-rational spirit of the Islamic theory of knowledge (Chapter 3) was also accomplishing the mission of mankind in separating science from magic and superstition. For example, the *Book of Agriculture*, the most important medieval work on agriculture science, was written in the sixth/twelfth century by Ibn al-Awwam and translated in the thirteenth/nineteenth century into European languages. It had its beginnings in the early fourth/tenth century work by Ibn Wahshiyya, *Nabataean Agriculture*, which gave information on agricultural sciences mixed with superstition.[20] Ibn Khaldun reports that the Muslims who translated the *Nabataean Agriculture* restricted themselves to the part dealing with agriculture. 'They completely banished all discussion of the other part of the book' dealing with sorcery, which 'remained neglected,' since it is forbidden by the *sharī'a* (Chapter 3). Ibn Khaldun then mentions the 'many books on agriculture by recent scholars' which, avoiding the occult sciences, 'do not go beyond discussion of the planting and treatment of plants, [and] their preservation.'[21] Relying on the bifurcation of knowledge into the realms of values (*sharī'a*) and facts (*'aql*, pure reason), that is, the *shar'iyya* and *'aqliyya* sciences, Ibn Khaldun makes the significant statement: 'The medicine mentioned in [the Prophet Muhammad's] tradition is of the (Bedouin) type. It is in no way part of the divine revelation. . . . Muhammad was sent to teach us *sharī'a*. He was not sent to teach us medicine or any other ordinary matter.'[22] The medieval Muslim doctors who were well educated in Islamic humanistic-social sciences and understood this, practiced medicine as *'aqliyya* science. They repudiated miracles by repeating after the Prophet Muhammad who was made to say in the Quran: 'I am a man like you'.[23] This was at a time when Western-Christian doctors were treating their patients with solutions of ground icons and by amputating one limb after another to drive away the evil spirits possessed of them.[24]

In earlier chapters we alluded to the growth of the Quranic-Islamic socio-cultural subsystems of law, religion, science and technology, state and government through diffusion of *sharī'a*-conforming values and philosophy, the neutral and universal rational sciences, and empirical vehicles or instrumentalities of the pre-Quranic socio-cultural systems. This was necessary to make the system of meanings or values of the Quran an *empirical* socio-cultural system. The non-Muslim human agents of these subsystems became the agents of diffusion through their contributions, and by adopting Islam and thus becoming agents of the Islamic ideological culture. We are, therefore, justified in asserting in a sociological sense that, in the process of transformation into the *empirical* Islamic

socio-cultural system, the ideals or system of meanings of the Quran were Arabised, Persianised, Byzantinised, Hellenised, Africanised and Indianised, through imitative-innovative assimilation of the existing empirical vehicles and the transformation of their human agents into bearers of the Islamic personality. Such was the case in a subsystem of technological culture: the medieval Islamic system of science was initially an imitation of the Greco-Roman, Zoroastrian, Alexandrian, Assyrian, Hindu and other systems of science and technology. We are here dealing only with the period of *rejuvenation* of Islamic culture in the first/seventh to third/ninth centuries. This does not deny the development during the later centuries of Islamic technological culture through self-sustained creativity and originality rather than primarily imitative-innovative processes.

Islamicisation of the West: imitation-innovation processes in Catholic-Protestant Reformations and Renaissance

The Islamicisation of the West stands for diffusion and assimilation of Islamic culture. This is distinct from Islamisation by which we mean the conscious acceptance and implementation of the ideal Islamic cultural patterns by non-Muslims and nominal Muslims. Islamicisation is sociologically similar to, though not identical with, Westernisation and Sovietisation subject to the limits and conditions of imitative-innovative social change discussed in the next section.

The Islamicisation of the medieval West occurred, first, during the period ending around the middle of the fifth/eleventh century before systematic translations from Arabic into Western languages began; second, during the age of Arabic translations coinciding with the Little Renaissance of the fifth/eleventh to the seventh/thirteenth centuries; and, third, during the Catholic-Protestant Reformation and Renaissance of the eight/fourteenth to the tenth/sixteenth centuries.

This much neglected fact of the Islamicisation of the medieval West-European Christendom is briefly substantiated here. The rectification of history and sociological theories based on it are essential to delineate valid principles of socio-cultural rejuvenation, to make such rejuvenation a science based on the processes of imitation and innovation, and to provide the correct historical perspective for contemporary Islamic technological and ideological modernisations through selective Westernisation, Sovietisation, and borrowings from Maoist China and all other cultures and countries of the world. The historical proof of Islamicisation is an effective reply to the non-Muslim detractors and Muslim sceptics of the ideal Islamic culture; for if it was the donor culture and enjoyed world hegemony in science and learning for over half a millennium, there is a valid argument for its contemporary rejuvenation.

A classical example of Western self-misrepresentation and ethnocentrism through falsification of history and the denial of Islamicisation is

provided by the historical claims of Max Weber.[25] Weber ascribed originality and uniqueness to Western genius for the immaculate conception – in the womb of the Protestant ethic, of rationalism, scientism, economism and utilitarianism, that is modernity. This has been refuted definitively by Sorokin[26] on the basis of tabulated historical data on the temporal fluctuations and distribution by country of origin of technological inventions, and discoveries in natural and physical sciences. Sorokin marshalled similar data on creativeness in ten socio-cultural subsystems such as business, science, scholarship, music and religion. These data showed that scientific and other creativeness began to increase, long before the emergence of Protestantism, in the Western Catholic countries, Spain, Portugal and Italy; these countries were pre-eminent in the West from the fifth/eleventh to the eleventh/seventeenth centuries; and when scientific hegemony passed on to the Protestant countries in the twelfth/eighteenth and thirteenth/nineteenth centuries, it could not be correlated causally with either Catholicism or Protestantism since countries with both backgrounds suffered cultural decline or growth. Sorokin classified the main supersystem of culture mentality into the ideational, sensate, and idealistic (balanced or integrated).[27] He attributed the Western rejuvenation to its transformation from an ideational to an idealistic culture as 'a harmonious blending together, into one system, of the truths of faith, of reason, and of senses,'[28] that is the symbiosis of ideational and sensate culture metalities. This age of idealistic rationalism lasted from about the end of the fifth/eleventh to the eighth/fourteenth centuries. Sorokin claimed that the 'greatest creators' of this idealistic rationalism were the seventh/thirteenth century Christian scholastics, St Albert the Great and St Thomas Aquinas.[29] Sorokin was definitely wrong in locating the emergence of idealistic rationalism at the end of the fifth/eleventh century in the West.

As Islamic idealistic rationalism, not as Christian-Western, it had existed in Muslim Spain and Muslim Sicily on Western soil for centuries. Long before the Crusades it had been radiating from there to banish the Christian-Western 'Dark Age.' The Muslim idealistic rationalists precede the Jewish and Christian scholastics. European Christendom was borrowing and assimilating Islamic ideological culture, including philosophy or theology, not only directly from original Arabic sources and the Latin translations of the works of al-Kindi, al-Farabi, Ibn Sina, al-Ghazali, Ibn Rushd and others, but indirectly through the translated works of Jewish scholastics (for example, Maimonides) who had earlier come under even deeper Islamic influences.[30] This borrowing of Islamic philosophy by the Christian scholastics is now an established fact of the history of philosophy.[31] St Albert and St Thomas were among the greatest imitative-innovative assimilators of Islamic ideological culture. Sorokin cited the theory of knowledge of St Thomas as an example of 'a European variety of Platonic-Aristotelian idealistic rationalism.'[32] This is incorrect.

Reverend Hammond proved recently, placing in parallel columns passages from their works, that St Thomas plagiarised the ideas as well as the phraseology of Al-Farabi (d. AH 399/AD 950) concerning the theory of knowledge, and other ideas.[33] This Islamicisation of Western-Christian ideological culture was partial. For example, it is said that St Thomas was 'eclectic with regard to his sources, but as firm as a rock with regard to his own dogmatic purposes.' He was 'deeply influenced by Muslim philosophy . . . chiefly by al-Ghazali and Ibn Rushd, but his own point of view was fundamentally opposed to Averroism . . . The aim of his life was to reconcile Aristotelian and Muslim knowledge with Christian theology.'[34]

Sarton believes that the turning point of creative output and world intellectual hegemony of medieval Muslim science and learning was reached by the end of the fifth/eleventh century; and Muslim science began to influence Western science systematically only from this time on. While the sixth/twelfth and seventh/thirteenth centuries were, compared with the preceding centuries, a period of decline and destruction of the Islamic material or technological culture, this was the period of the most feverish activities in the West for imitation and absorption of Muslim science and learning. The peak of the prestige of Islamic science and learning was reached beginning at the end of the seventh/thirteenth century. While the decline of medieval Muslim science began about the end of the sixth/twelfth century and was completed by the end of the ninth/fifteenth century, the decline of the influence on the West of Muslim science began in the eighth/fourteenth and ended in the tenth/sixteenth century.[35]

The transformation of the West during these centuries until the tenth/sixteenth, passed through several stages of contact and conflict with Islamic culture. The West resorted to various strategies vis-à-vis 'the problem of Islam.'[36] Until about the end of the fifth/eleventh century, the Western views of ideal Islam and its cultural and militarily triumphant civilisation were fostered by sheer ignorance and Biblical exegesis, and relative intellectual and physical isolation. Modern Western scholars regard these medieval Western views of Islam 'at best as absurd, and at worst as filthy, deceitful and insane.'[37] This led to the expected apogee of Western zealot type response, the Crusades of the sixth/twelfth and seventh/thirteenth centuries. The extensive contacts with the superior Islamic culture and Muslims during the Crusades ushered in a new era in Western self-consciousness, and awakened both the uncreative Herodian and adaptive-creative responses to Islamic culture. The highest intellectual achievements of the West during these two centuries, sixth/twelfth and seventh/thirteenth, comprised the imitation of Islamic science and learning. Universities were founded in the West patterned on the Muslim universities to assimilate the new knowledge made available by translations of the works in Arabic and, to a lesser extent, of Greek classics

which had been superseded by the Muslims.[38] The works of St Albert, St Thomas and Roger Bacon (d. AD 1292) represent, in their basic nature, 'a tremendous will to conquer'[39] learning primarily by borrowing from the Muslims. The Western myth of Roger Bacon as the founder of the experimental method[40] has been exploded[41] though it remains to this day esoteric knowledge. Bacon was a student and agent of diffusion in the West of the well-established scientific method of the Muslims. Bacon abandoned the Bible as an instrument for understanding the role of Islam in the world. He opposed the militant and zealot responses of the Crusades, and Western obscurantism. He untiringly advocated the necessity of learning Arabic and the Muslim sciences and philosophy as the only way to true knowledge for Christian Europe.[42] Though Roger Bacon like other medieval Western scholars does not acknowledge his Islamic borrowings, Part V of his *Opus Majus* is almost a copy of the *Optics* of Ibn Haitham (d. AH 430/AD 1039).[43] Bacon was one of the most outspoken agents of diffusion of Islamic culture in the West; for this he was imprisoned during the last fifteen years of his life.

The Western-Christian pre-Reformation ideological and institutional obstacles to Islamicisation are also well exemplified by the career of Frederic II, the 'semi-Muslim' Hohenstaufen Emperor of Rome (AH 612–648/AD 1215–1250).[44] His friends were caliphs and sultans whose gifts adorned his court; professors of Muslim science were his constant companions. He patronised translations of Arabic books and popularised them; established the first medieval Western university at Naples, and then others at Messina and Padua; and introduced advanced Muslim medicine in the school of Salerno. Pope Gregory IX called him an anti-Christ and stirred revolts against him for 'the Church dreaded . . . the new intellectual light which was being flashed across the darkness of Europe'. Repeatedly excommunicated, 'vanquished, baffled, betrayed, harassed, disheartened, embittered by long years of strife and daily peril,' Frederic II capitulated to the pope and departed from Italy on a Crusade. In Jerusalem, 'that strangest of crusaders' was received by Sultan al-Malik al-Kamil as an honoured friend. Discussing with the learned Sultan the latest advances in mathematical sciences, and 'the folly of men who like darkness rather than light,' Frederic II exclaimed: 'Happy Sultan who knows no pope!'[45] These were prophetic words pointing at the Christian institutional obstructions to Islamicisation. The concept of an anti-Christ was shifting from the Prophet Muhammad to Western Islamicisers and, at the hands of the Protestant reformers, to the popes!

The destruction of the Abbasid world-state gave rise to 'the hopeful decades' of the latter half of the seventh/thirteenth century. The European kings and popes carried on a brisk diplomatic activity, the Western strategy being to bring about the end of Islam through a joint attack from the West and, with the help of the Mongols and Nestorian Christians, from the East.[46] This did not materialise, for the Mongols, while continu-

ing on their destructive path well into the ninth/fifteenth century, were gradually embracing Islam.

Biblical exegesis, war and strategem having failed, and efforts to assimilate Islamic culture through reform of and within the Church having been frustrated repeatedly, the moment of vision at last dawned upon Western Christendom. John Wycliffe (d. AD 1384), the 'Morning Star of the Reformation' articulated a timely message in calling for reform of the Church by imitation of the Muslims. He began a new era by pointing inwards at Christians and their own deficiencies as an explanation for their lack of success. He attacked the pope and ecclesiastical authority, defended individual reason and conscience, and claimed the superiority of the Bible over the Church. He believed the cause of Muslim success was their universal religion which sanctioned worldly pursuits, self-will, and secular dominion. The success of Christendom lay in its development like the Muslims for, Wycliffe said, 'opposites are dissolved by their opposites.'[47]

The ninth/fifteenth century experienced continued Islamicisation of the West and a variety of responses to the challenge of Islamic culture. The Spanish cardinal, John of Sevogia (d. AD 1458), advocated peaceful communication with the Muslims. But Jean Germain (d. AD 1461), a French bishop interested in rallying Christendom to a sense of its own identity, preached a return to Crusader militarism; 'above all, he hated those Christians – merchants and others, in increasing numbers – who travelled in Islam and came back with scruples and criticisms of the Christian faith. Unlike John of Sevogia, he feared the contamination of discussion.'[48] By this time the Islamised Turks had seized power in the Muslim world under the Ottoman dynasty. They had taken over the Balkans and Constantinople and, breaching and reaching the outposts of Western Europe, stood on the Adriatic threatening Hungary.

At this point came Martin Luther (d. AD 1546). He was, perhaps, more specific and thoroughgoing in his reform programme than Wycliffe and others who had claimed that there can be no solution to the problem of Islam until Christian reformation was completed. He strove to eliminate asceticism, monasticism, celibacy, mendicants, the domination of the Church, the cult of saints and holy days, the indissolubility and sacredness of marriage, and monogamy inasmuch as he admitted polygamy as lawful. Rejecting the notion of some work as holy, he taught the sanctity of all work and the ethic of worldy success.[49] Luther, like Wycliffe, rebelled against ecclesiastical authoritarianism, and vindicated individual reasoning and conscience; for without this it was not possible to conduct independent study either to seek God or develop science and philosophy as was so well demonstrated by the triumphant Islamic culture. The adversaries of Luther were not wrong when they accused him of imitating Islamic tenets. Therefore, Protestantism has been looked upon by Zia Gokalp as an 'Islamicised form of Christianity'[50] more than reformed Catholicism.

There was an essential unity of thought in the approach to Islam among the Protestant reformers from Wycliffe to Luther. 'Like Wycliffe, Luther also saw the Islamisation of the West in the typical products of the Middle Ages.'[51] However, what distinguished Luther from Wycliffe and guaranteed the success of the former was not only the erosion in the popular mind of the image of Islam and Muslims created by priests and popes, but also the new political and military realities. The Ottomans had continued their territorial expansion into the heart of Europe. In AH 936/AD 1529 when the Ottomans reached Vienna, Luther wrote a tirade against the Turks but the villain of the piece was the pope, the insidious and 'true antichrist'[52] who symbolised the ideological and structural impediments to Christian rejuvenation. In AH 949/AD 1542, the Ottomans overran Hungary and it seemed that France and then Germany might succumb. Luther now translated into German an anti-Islamic polemic of the seventh/thirteenth century, adding a preface and an appendix. He reinforced his plea for Christian internal reform with bitter rage and pessimistic forebodings about the chances for Christianity. War was useless against Islam so long as Christendom slothed in its sins for, Luther wrote, 'God will never give us victory when such people as those we have fight for us.'[53] The Muslim military threat to Europe did not materialise but the Christian resistance against Islamicisation that had defied a very long line of reformers was, at last, overcome.

The Islamicisation of the medieval West teaches us the self-defeatism of obscurantism and xenophobia, of zealotism and uncreative Herodianism, of militarism and all other externalistic solutions. Socio-cultural rejuvenation depends ultimately on indigenous change and efforts. 'Surely God changes not the condition of a people, until they change their own condition.'[54] It teaches us the imminence of truth, ideological and technological, which we can oppose, deny, and remain ignorant of at our own peril. The non-recognition of imitative-innovative processes of rejuvenation in Christian thought made conscious dissimulation a necessity so that exogenous change through Islamicisation might be made to look like autogenous change. This is true of the Catholic-Protestant scientists and philosopher-theologians mentioned above. Even the secularised Western social scientists of this century have not been able to break the bonds of this age-old Western-Christian intellectual tradition of misrepresenting themselves to themselves.[55] The long period of Catholic-Protestant medieval rejuvenation, involving physically and psychologically painful and morally degrading processes, is the most eloquent testimony to the value of legitimising imitative-innovative processes of social change – a distinct characteristic of the Quran, the *Sharī'a*, the Islamic philosophy of knowledge and education, and the Islamic sociology of science and culture. The conscious adherence to these Islamic principles of imitative-innovative socio-cultural dynamics enabled the early post-Quranic Muslims to lay the foundations of, and develop with amazing rapidity, the

noble and magnificent edifice of medieval Islamic ideological and scientific culture. Each new Islamised nation and race, and those who chose to retain their non-Muslim identity, took their rightful place in the vanguard of Islamic civilisation;[56] this is in contrast to the history of mankind ever since the world passed under the hegemony of Western civilisation and its heretical offshoot, Marxism-Leninism.

This fact of medieval Islamicisation of the West needs to be fully researched, accepted, and incorporated in specialised works and in the teaching materials of schools and colleges around the world. The consequences of this will be far reaching in understanding the socio-cultural rejuvenation and modernisation of the African, Asian, and Latin American developing nations; in building up a genuine and universally acceptable theory of social action, and in ridding sociology of ethnocentrism; in removing the burdens of historical romanticism and apologetics imposed upon the underdeveloped nations (and suppressed minorities like the blacks in the USA) as a reaction against the cultural arrogance of nations and ethnic groups which are highly developed today but had their own dark ages at some other time; and in promoting international understanding and co-operation for development and world peace.[57]

Universal patterns of imitative-innovative rejuvenation of empirical socio-cultural systems

Sociologists and philosophers of culture and history have tried to derive 'laws' governing social change. There does not exist complete agreement among them.[58] This is partly due to the fact that they are dealing with social change under certain basically different conditions and assumptions.

Our use of the term socio-cultural 'rejuvenation' connotes a point of time during a system's life when the system as a whole or some of its subsystems are in transition from a period of relative decline or stagnation to a period of reactivation and development, or growth as defined below. This denotes a break in history, and a change of direction in the life cycle of a socio-cultural system or its subsystems. If the system that is experiencing rejuvenation exists in a universe of other diverse systems, particularly when they are superior in any parameter of growth, then the potentialities for cultural diffusion and borrowing among them exist. The relations between the systems reflect the condition of the early post-Quranic Islamic society, the medieval West during its Islamicisation, and the contemporary developing nations. From the Islamic point of view, such rejuvenation stands for Islamisation or Islamic modernisation, that is, the reform or development of behavioural patterns of Muslim culture to bring it into conformity with the ideal patterns of Islamic culture. An example of this is the Islamic political modernisation discussed in this chapter.

The three components of a living empirical socio-cultural system are, according to Sorokin:

1 values or ideals or a system of meanings; primary, for example, a *sharī'a* constitution and water code, and principles of hydrology, and secondary, for example, statutory laws and detailed regulations of a water code falling within the jurisdiction of ephemeral *fiqh*;
2 a causal system of empirical vehicles and instrumentalities, for example, legislature; dams and wells; books; buildings;
3 human agents, for example, parliamentarians; teachers and students.

'Cultural' systems refer to a particular law, art, science, politics; and a 'social' system means, for example, a family, state, business firm or scientific society.[59]

The system of meanings comprises the *sharī'a*- or value-oriented, the non-material or ideological culture; the system of empirical vehicles comprises the universal rational or non-*sharī'a*, the material or technological culture (Chapter 3). Together they make an *empirical* socio-cultural system or civilisation. Without its human agents, it is not a *living* system but only a system of ideals and meanings.

A few general principles of imitative-innovative socio-cultural rejuvenation are presented after Sorokin.

1 *Forms of growth of empirical socio-cultural systems: quantitative and qualitative.* The former signifies quantitative increase of empirical vehicles, or human agents, or both. (The secondary values, that is, laws, regulations, rules, standards and criteria in the realm of *fiqh* concerning water resources systems in Chapter 4 are, for example, amenable to quantitative increase in a growing system.) Qualitative change implies improvement and perfection of any or all the three components of the system. The two forms of growth of the three components lead to 'integration' of the system.[60]
2 *Limits in direction of socio-cultural change.* An empirical, socio-cultural system, from the moment of its inception, 'is a self-changing and self-directing unity that bears in itself the reason for its change, the nature of its functions, the phases of its unfolding, and the essentials of its destiny. As such, it has always a margin of autonomy from all the forces external to it.'[61] Thus external forces can help or hinder the growth of the message of the Quran but only the Quranic legal, political, economic, and other subsystems can emerge from the Quran.

   External circumstances are relevant mainly in weakening or reinforcing the inherent traits, and in helping or hindering the flowering, of the immanent potentialities of the system. The external forces may even destroy one or all of the three components of the socio-cultural system: the system of values, the empirical vehicles or material culture, and the human agents. But the external forces cannot change the fundamental character of each phase, or the sequence of phases, in the development of the immanent destiny of the system.

This predetermination of the system's destiny pertains only to the principal phases and direction of the system; the rest comprising most of the details is subject to free choice of the system and unpredictable influences of the environment and chance. Thus the immanent self-determinism of the system is a synthesis of determinism and freedom.[62]

3 *Selectivity of system.* Any empirical socio-cultural system tends to assimilate what is, and reject what is not, consistent with it. This constraint of selective imitation and innovation mainly concerns the system of values and, to a lesser extent, the empirical vehicles or material culture and human agents. One system easily assimilates the elements of another socio-cultural system which are in terms of values or ideology neutral or indifferent but not opposed to it. The system cannot assimilate an element of another socio-cultural system which implicitly contradicts the primary values of the system; if it does then those elements become, sooner or later, explicit and then either split or modify the system of values and the socio-cultural system itself.[63]

4 *Limited possibilities of variation of a system.* A socio-cultural system can retain its identity amidst variations in its secondary values if the variations do not undermine its primary values. The possibilities of variation are much larger, but not unlimited, in regard to empirical vehicles (that is, the material or technological culture) and the human agents.[64]

5 *Differential degrees of self-determination and dependence for various socio-cultural systems.* The potentialities of the system are not absolutely and narrowly predetermined by either its immanent self-determination or external conditions. The potentialities always have a margin for variations, especially on the fringes, which must be described in detail in each specific case.

The margin of self-determination of the system varies with the kind of social or cultural system, and the kind of external milieu. Other things being equal, the better integrated the social and cultural systems, the greater their autonomy from the environment in moulding their own destiny. The integration of the system depends upon the existence and extent of causal and meaningful interdependence between the components of the socio-cultural system, the character of solidarity relations between system agents, and consistency between the components.[65]

These and other principles were employed in the preceding chapters to elucidate the principles of environmental engineering systems planning within the context of Islamic culture. These principles are interpreted below to sum up and bring within their purview the discussion in this and the preceding chapters.

Summary and conclusions: imitative-innovative rejuvenation of Islamic environmental engineering systems

Humanism, altruistic activism, and imitative-innovative social change are some of the fundamental principles of socio-cultural dynamics of the Quran (Chapter 1). These were further identified as the fundamental principles of the methodology of the *sharī'a* (Chapter 2). Islamic law and epistemology enabled us to identify the value-oriented and the universal rational realms of social action and all the sciences (Chapters 2 and 3). The value-oriented realm of disciplines comprising environmental engineering systems is conceptually identical to Sorokin's primary values or the primary system of meanings – *sharī'a*-oriented, and the secondary system of meanings – *fiqh*-oriented.

The system of primary values comprises the explicit obligatory and forbidden *sharī'a* value-orientations. It is the essence of Islam. These primary values admit limited variations in *interpretation* from generation to generation. However, the ephemeral *fiqh*-orientations, the domain of derivative and secondary values and ideals in the humanistic-social sciences, are the main field of quantitative growth and multiplication, and qualitative modification and improvement. These secondary values are susceptible to limited variations and cross-cultural borrowings as long as the consistency with *sharī'a* as the primary values is maintained. The universal rational realm of environmental engineering systems might be identified with the vehicles of the empirical socio-cultural system. This includes the realm of the scientific-technological stem of engineering systems. This stem is subject to the scientific method as the primary value but within this constraint all the sciences and technology are amenable to the widest possible quantitative and qualitative growth and cross-cultural borrowings. Thus the secondary values in the *fiqh*-oriented realm and the causal vehicles and instrumentalities are marginally but not absolutely autonomous of the *sharī'a*. This was brought out in al-Ghazali's critique of the fraudulent 'philosophers' and the criteria that make actions praiseworthy and sciences blameworthy (Chapter 3). The principle of 'blocking of means' requires consistency of means with ends (Chapter 5). We have followed these principles in previous chapters in elucidating principles of the Islamic state, and the methods and contents of decision-making and planning for environmental engineering systems (Chapter 5); and in deriving principles of Islamic welfare economics pertaining to environmental engineering planning and employing positive economics as their empirical vehicles (Chapter 6).

Throughout this work we have emphasised the indispensability of imitative-innovative processes, and their Islamic principles of socio-cultural rejuvenation. We summarised in this chapter the scope, limits, and nature of diffusion of earlier socio-cultural systems in the growth of

post-Quranic Islamic civilisation, and in the Islamicisation of medieval Western-Christian science and philosophy. The examples given in this chapter show the selectivity of the primary values of Islamic and other ideological cultures, and the limited possibilities of their variation through imitation and innovation. Therefore, contemporary Islamic scholars and governments must develop an Islamic primary and secondary system of values, norms, ideals and criteria, that is, an Islamic ideological culture pertaining to the humanistic-social sciences stem of environmental engineering systems (Chapters 2 to 6).

The discussion on cross-cultural diffusion of science and technology in this and Chapter 3 shows the universality of the material or technological culture, and the relatively greater freedom of these *empirical* vehicles of socio-cultural systems from value-orientations unique to an ideology or value-system. The medieval Muslim and the modern Western, including the Communist, systems of science grew through selective borrowing and assimilations. The greater possibilities of their variation and cross-cultural borrowing suggest that Muslims can and should borrow and adapt from contemporary developed non-Muslim nations the material and technological culture more thoroughly and with greater freedom from concern for compatibility with Islamic ideological culture.

Material and technological culture, or the scientific-technological stem of environmental engineering systems in particular, have their basis in ideological culture. Contemporary sociological theories interpret social change and development, broadly speaking, either in terms of ideological determinism or material determinism. The economic determinism of the Marxists, and technological determinism of Thorstein Veblen and others, are examples of the latter.[66] The history of medieval Islamic civilisation proves the primary role of Islamic ideological culture in the genesis and development of science and technology, and all other elements of Islamic socio-cultural system. We discussed the Quranic emphasis on scriptural revelation, and the sciences of man and nature as two authentic sources of knowledge (Chapter 1). On this are based the Islamic philosophy of law and knowledge, and the juridico-sociological classification and evaluation of knowledge and social action as *shar'iyya* and non-*shar'iyya*. The non-*shar'iyya* types of knowledge (in both the humanistic-social sciences stem and the scientific-technical stem) are acquired through the demonstrative or the scientific method inspired by the Quran (Chapters 1 and 3). The cognition, indoctrination, and implementation of this Islamic idealistic rationalism by the medieval Muslims enabled them not only to discover and develop the scientific spirit through separation of medicine from miracles; astronomy from astrology; chemistry from alchemy; in short, science and technology from magic and superstition; but they also developed an integrated or 'idealistic cultural mentality.' Since the invasion of ideal Islamic culture patterns by mass religion and Sufi theosophy during the last few centuries, the very Quranic verses have

been used as charms and prayers to derive unearned benefit or ward off deserved harm. Indeed, even at the present time in the Muslim world, dissolved solutions of Quranic verses are used by ignorant Muslims to treat patients. It is essential to indoctrinate ideal Islamic culture, through education and various means of communication, to banish 'traditionality,' that is, irrationality, credulity and superstition. Much of this un-Islam masquerades as Islam due to the ignorance of Muslims and confusion in their minds regarding the distinct sources, domains, methods, subject matter, and problems of the *shar'iyya* and non-*shar'iyya* realms of knowledge, and the hierarchy between these realms (Chapter 3). The development of Islamic environmental engineering systems depends upon the indoctrination of this Islamic ethic; the revival of humanistic scientism and legal idealism (Chapters 2 to 4); the ubiquitous application of the principle of rule of *shari'a*, and the idealistic rational methods and contents of Islamic planning and democracy (Chapter 5); and the implementation of Islamic altruistic economism, and the rational methods of engineering-economic decision-making subject to Islamic ethical and egalitarian constraints (Chapter 6).

The first and fifth principles of socio-cultural rejuvenation presented in the preceding section dealt with its growth and integration. In contemporary times, the problems of development facing Muslim countries concern all the three components of the socio-cultural system. In the realm of ideological culture, there is need for identification, detailed explanation, and communication of primary and secondary Islamic values pertaining to all the disciplines comprising environmental engineering systems. The major thrust of this dissertation has been in this direction. This was called the axiological systematisation of Islam (Chapter 1). The second component of the socio-cultural system dealing with the empirical vehicles and instrumentalities calls, for example, for practical activity in development, construction, and management of water resources projects. The third component of the socio-cultural system dealing with the human agents calls for Islamic socialisation, acculturation and indoctrination through education and training of Muslims. Great strides are being made in the Muslim countries in the development and construction of environmental engineering projects, and in development of the scientific-technical stem of engineering education. The relative neglect of the humanistic-social sciences stem of engineering education from Islamic ideological perspective (Chapter 3) must be counted as a lacuna in the growth and integration of the total socio-cultural system. This neglect is not so much in education and acculturation of basic Islamic ideology; rather, it is in developing the detailed secondary system of meanings in the various subsystems or disciplines comprising environmental engineering systems. This dissertation has made some tentative progress in this direction. This is the most challenging and difficult task faced by civilisations. Our review of the history of medieval Western

civilisation shows that such tasks culminated for Catholicism in the seventh/thirteenth and for Protestantism in the tenth/sixteenth centuries – centuries after the first impact of Islamic culture on Western Christendom. Similarly, the assimilation; refutation of Jewish, Christian, Hellenic, Manichaean, Zoroastrian, Hindu, and other ideological cultures; and the eventual crystallisation of the legal, philosophic and scientific systems of medieval Islamic culture took place over a period of centuries.

However, no renascent socio-cultural system can make a standstill agreement with history. During periods of rejuvenation, such as contemporary times for developing Muslim countries, all renascent cultures find themselves in compromising situations. Islamic culture allows some compromises with its ideology in the short run under the concepts of necessity, constraint, gradualism, and facilitation (Chapters 2 and 4). Particularly in the early stages of socio-cultural rejuvenation, therefore, extraneous borrowings and innovations inconsistent with the Islamic ideological culture are permissible conditionally. These compromises should be consistent with the principles of self-directing unity, selectivity, and, the limited possibilities of variation discussed above. The compromises under constraint must be restricted to secondary values only temporarily. However, the permission for compromise does not make expediency (*ḥīla*) permissible since, as Muslim history of the last fourteen centuries shows, it exposes *sharī'a* to the peril of complete betrayal.[67] Therefore, there should be no compromise with *sharī'a*, the primary system of values, for it destroys the *raison d'être* of the Muslims and the Islamic socio-cultural system.

Glossary

Notes

(1) All words are of Arabic origin unless otherwise indicated.
(2) Words of Quranic origin and meaning are often indicated by the abbreviation Q for specificity.
(3) The definite article al- is sometimes ignored for the purpose of alphabetical listing.
(4) The meanings given are in accordance with the context and interpretation of the concept in the text, and are often brief.

'ādah custom
adhān prayer call
'afwa surplus
ahl al-ḥall wa al-'aqd lit. those who loosen and bind; public decision-makers or legislators
ahl al-shūrā lit. participants in consultations, members of legislative assembly or parliament (or any body for deliberation)
aḥsan the best
ajr wages, reward
al-ahkām al-sulṭāniyya administrative law
al-aṣl al-ibāḥah all that is not forbidden by *sharī'a* is permissible by presumption
al-dunyā the world
al-ghayb the unseen (in this world and the hereafter)
Allāh (al-Ilāh) God (the God)
al-manqūl lit. the reported; traditional
al-ma'qūl the rational
al-ma'rūf lit. that which is good and enjoys popular acceptance and, therefore, implicitly permissible by the *sharī'a*
al-maṣlaḥa public interest
al-nafs al-ammāra Q. lit. the inclinations of the soul or self; the passionate or sensate propensities (towards evil)
anfāl Q. free goods, unearned benefits
anṣār-Allāh Q. lit. helpers of God; those who apply the ethical and scientific laws of God and, thus, become instruments in establishing His will

'aql pure or natural reason
'aqliyya rational, intellectual
al-'aṣabiyya group loyalty, community of interests, solidarity of social groups
– *al-khābitha* unscrupulous, wrong kinds of group solidarity; chauvinism
– *al-kubrā* supreme loyalty; solidarity among larger groups for broader interests, greater communal ethos (that is permissible)
aslama lit. he submitted or entered into peace (Islam), to submit to God's will, to become a Muslim
awliyā' (sing. walī) lit. friends; in Sufi thought and popular religion the saintly men who achieved nearness to God and can intercede with God or achieve miraculous results.
– *Allāh* Q. lit. friends of God; those who understand and obey God's will or laws in ethics and science, for example and hence have harmony with and closeness to God, and success.
āyāt Q. verses (of the Quran) and the signs or portents (of God's will)
– *Allāh* Q. verses of God (revealed in the Quran), and the portents of God's will in the universe such as the laws and principles of science, technology and socio-cultural dynamics

badāwā primitive, rural, undeveloped
bayt al-māl public treasury
bid'a, innovation; in Islamic law and culture anything new not found in the Quran and Sunnah
– *ḥasana* good innovation
– *khābitha,* or – *sayyi'a* bad, wrong innovation
bukhul niggardliness
burhān proof, rational demonstration

ḍarar injury, damage
dahriyyūn materialists
ḍarūra necessity
dawā'ir fine, burden
dharī'a means

fai' Q. spoils of war acquired without a fight
al-falāsifa the 'philosophers'; the medieval Muslim natural (and social) scientists who pursued knowledge allegedly in the Greek (Peripatetic) tradition
falsafiyya philosophical, scientific (medieval)
al-farḍ the obligation; the duty ordered by God
– *al-'ayn* individual obligation, personal duty
– *al-kifāya* socially requisite; a duty to be performed be one or some until a social need is satisfied
fiqh lit. discernment; Islamic positive or substantive law
fiṭrat Allāh Q. lit. course of God; the unchanging occurrences and laws of the universe, nature, history, etc., which owe their continuity and regularity (permanence) to God's will
furū' branches

ḥaḍāra civilisation, the urban or developed society and culture
ḥadd Q. limit, the constraints imposed by God on what is permitted, forbidden, the punishments, etc.

Ḥadith sayings of Prophet Muhammad
Ḥajj pilgrimage to Mecca
ḥaqq a right
ḥarām forbidden (by *sharī'a*)
ḥarīm the reserved and protected open space around a water source
ḥīla expediency
ḥisba office for market supervision
ḥiyal expedients
ḥizb Allāh Q. lit. party of God; those who follow the ideology prescribed by God
– *al-shaitān* Q. lit. party of Satan
ḥuqūq Allāh lit. rights of God; rights of society
– *al-'ibād* rights of individuals
ḥusn good, beauty

iḍṭirār constraint, extreme stress
ijāza certificate of proficiency
ijmā' consensus
– *al-fi'al* consensus of practice
– *al-sukūt* silent assent, implicit social acceptance
– *al-ummah* consensus of the community
ijtihād systematic original thinking, private expert opinion on questions of Islamic law
ijtihādiyya school of thought which calls for continuous exercise of *ijtihād* instead of imitation of custom and obedience to decisions of traditional Islamic law
ijtihādiyyūn holders of *ijtihādiyya* opinion
ikhtilāf dissent
ilāhiyyūn theists
'illa cause, motive
'ilm (pl. 'ulūm) knowledge, science(s)
– *al-mu'āmalāt* knowledge of transactions; Islamic law concerning dealings among people, such as civil, criminal, personal, and international
imām leader
imārat al-isti'lā' power assumed by seizure, government by force
infāq spending
iqtiṣād moderation
iqtisār limitation
'iṣmah infallibility
isrāf extravagance
istiḥsān preference for the better
istiqsā' thoroughness
istiṣlāḥ striving for what is in the general interest, public interest

jabbār al-'anīd Q. stubborn tyrants
jahada to drive, to struggle
jazā' recompense
jihād lit. striving, confrontation, contention
jins al-ba'īd distant genus
jizya compensation tax

kāfir ingrate; rejector of God's will and blessings; rejector of Islam
kasab earning
khalīfa caliph, vicegerent
khalq Allāh Q. lit. creation of God
khayr good, welfare, advantage
kifāya requisite, sufficiency
kufr ingratitude; disbelief in God and Islam

madhmūm blameworthy
maḥmūd praiseworthy
Majallah first partial codification of traditional Muslim civil law enacted for the Ottoman Empire in AH 1293/AD 1876
al-majlis al-shūrā consultative (legislative) assembly
makrūh undesirable
mandūb recommended
maqṣad purpose
al-maṣāliḥ al-'āmma public interest
– *al-kāffa* universal common good
mubāḥ permissible
muftī expert on Islamic law who gives a legal opinion
muḥkam decisive, Quranic verse (*āyah*) which gives an unambiguous and decisive ruling
mulk sovereignty; hereditary kingship; private property
– *ṭabī'ī* lit. 'natural' kingship, arbitrary rule
muqaddimāt auxiliaries
Muqaddimah *The Prolegomena* (to Ibn Khaldun's *Universal History*)
mursal lit. set loose from; outside the direct scope of the *sharī'a*
mutammimāt supplementaries
mutashābih allegorical, conformable (Quranic verse that is not decisive but subject to different interpretations)
muṭlaq left specified

nafaqa to spend
naqliyya transmitted
nifāq hypocrisy
niṣāb non-taxable minimum base of wealth and income
niyya intention

pīrs (sing., *pīr*, Urdu, Persian) in popular Islam, living saints and mystics who claim divine powers to solve problems miraculously; mystic religious guide; leaders who claim absolute power and obedience on pseudo-religious authority

qaḍā' administration of justice
qawā'id principles; legal maxims of the *Majallah*
qitāl war
qiyās analogy; *ijtihād*

ra'y opinion; *ijtihād*

ṣadaqah taxes, voluntary contributions or charity

sadd al-dharī'a blocking of means
Salafiyya Islamic purificationist movement calling for a return to true Islam as practised by the early pious generations (*salaf*)
ṣalāt the five daily prayers
shākir a thankful person
sharī'a lit. the clear path (ordained by God); Islamic fundamental law based on the Quran and *Sunnah*
sharī'at al-'Īsa jurisprudence of Christianity
– *al-Yahūd* jurisprudence of Judaism
sharika (sharikah) partnership (business)
shar'iyya of, based on, pertaining to, the *sharī'a*
shirk to associate with God; attributing divinity, divine powers and qualities to any but the One God
shūrā consultation; decision-making through institutionalised consultation and consensus
siyāsa 'aqliyya rational regime; state and culture which is rational (secular), this-worldly and sensate in goals, scope, and principles
– *shar'iyya sharī'a* regime (based on Revealed principles; state and culture which is Islamic (*shar'iyya*) and rational, and in goals and scope both other-worldly and this-worldly
ṣūfī Muslim mystic
sulṭān authority
sunan man kāna qablakum lit. traditions of those before you; traditions or laws of communities before the advent of the Prophet Muhammad
Sunnah the traditions of the Prophet Muhammad; what he said, did, or approved tacitly
sunnat Allāh lit. the Way or Custom of God; laws of nature, personal and social ethics, etc., that God has willed

tabī'iyyun naturalists; deists
tadrīj gradualism
taghallub despotism; tyranny
Tahāfut al-Falāsifa *The Incoherence of Philosophers* by al-Ghazali
takhayyar to select that wherein there is good, welfare, advantage
taklīf duty
talfīq lit. patching up or piecing together; eclecticism applied to judgements or opinions of classical Islamic positive law
t'āmul convention, usages
taqlīd imitation, traditionalism
– *maḥḍ* absolute, slavish imitation
taqlīdiyya traditionalists; school of thought which emphasises contemporary imitation of classical Islamic culture, esp. application of classical Islamic positive law (*fiqh*) decisions
taqlīdiyyun holders of *taqlīdiyya* opinion
taqrīr a kind of *Sunnah*; what the Prophet Muhammad implicitly approved or tolerated in the customs and cultures of his time
tā'wīl interpretation (made to conform with Orthodox views)
taysīr making things easier; leniency, relief of hardship

ūlū al-amr holders of leadership and authority; men of power in government or community
al-'ulūm (sing. *'ilm*) the various disciplines, branches of knowledge, sciences
– *al-aqliyya* rational or intellectual sciences, arts and crafts; knowledge obtainable through the God-given rational faculties of man and not susceptible to varied religious or ideological interpretations
– *al-naqliyya* the transmitted sciences; the knowledge based on Revelation or tradition which is acquired as transmitted from one generation to another
– *al-shar'iyya* the *sharī'a* sciences; social sciences and humanities, interdisciplinary studies, etc., based on or susceptible to *sharī'a* value-judgements and Islamic ideology
– *al-tabī'iyya* the natural sciences; knowledge acquired or obtainable by use of natural (*tabī'ī*) faculties such as reason, experimentation and experience, i.e., the rational (*aqliyya*) sciences
– *al-waḍ'iyya* the positive sciences
ummah (pl. *umam*) community, nation, the people
umrān civilisation
'urf custom

waḍ'iyya positive
wajha direction
wazi' the power or source that controls

zāhir self-evident
zakāt taxes decreed by *sharī'a*; v.t. *ṣadaqa*
zann personal conjecture

References

Chapter 1

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4 *Quran*, 2:164; 6:96–103

5 *Ibid.*, 25:53; 35:12; 55:19–20; 27:61.

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7 *Quran*, 30:20–2.

8 *Ibid.*, 13:11; 8:53.

9 *Ibid.*, 3:136; 6:11; 12:109; 16:36; 17:58; 30:9.

10 *Ibid.*, 22:45–6.

11 *Ibid.*, 3:136–41.

12 *Ibid.*, 12:111; also 7:176.

13 *Ibid.*, 3:189–90; 16:3; 18:7; 32:6–7; 37:6; 44:38–9; 64:3; 67:3–5. Cf. I. R. al-Faruqi, 'On the *Raison D'être* of the *Ummah*', *Islamic Studies*, II (June, 1963), 159–203.

14 *Quran*, 6:141–3; 7:31–3; 16:5–18; 20:53–4; 71:15–20.

15 *Ibid.*, 2:30–8; 6:166; 33:72.

16 *Ibid.*, 18:7; also 2:30; 6:166; 11:7; 29:2–4; 47:31; 67:2; 76:2–3.

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19 *Quran*, 2:208.

20 *Ibid.*, 84:19. See also S. A. Latif, *Bases of Islamic Culture* (Hyderabad, India: Institute of Indo-Middle East Cultural Studies, 1960), pp. 36–61.

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23 *Quran*, 35:43; 40:85; 30:30; and 67:3.
24 *Ibid*, 61:14; 22:40; 40:51; 47:7; 57:25.
25 *Ibid*, 10:62–4; 4:45; 12:101.
26 *Ibid.*, 58:22. Cf. 58:19 for the contrast with *hizb al-shaitān* (the satan's party). See also S. A. Latif, chapter 6, and M. H. Kerr, *Islamic Reforms: The Political and Legal Theories of Muhammad 'Abduh and Rashid Rida* (Berkeley: Univ. Calif., 1963), chapter 4.
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28 For detailed discussion of its forms and nature, see M. Ali, *The Religion of Islam* (Lahore: Ahmaddiyyah Anjuman Ishaat Islam, 1950), pp. 17–26, 201–23.
29 *Quran*, 20:49–56; 26:23–8; the confrontation between Pharaoh and the Prophet Moses.
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34 *Ibid.*, 2:37–8; 5:92–9; 6:84–91.
35 *Ibid.*, 5:70; 6:50; 7:63, 69; 13:38; 14:10–11; 16:43; 18:110; 21:7–8.
36 *Ibid.*, 35:24; also 10:47; 14:4; 16:36, 63.
37 *Ibid.*, 4:164; 6:84–8; 14:4; 40:78.
38 *Ibid.*, 2:285; 3:83; 4:136, 150–2; 42:13.
39 *Ibid.*, 9:128; 10:2; 12:109; 22:75; 28:68.
40 *Ibid.*, 3:48; 4:64; 5:67; 6:50; 7:188; 16:44; 21:25–9; 40:78.
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43 *Ibid.*, 3:66, 78–9; 4:64; 27:25–9; 42:13.
44 *Ibid.*, 2:130–3; 3:66; 5:44; 6:163–4; 12:101; 16:120–3.
45 *Ibid.* 22:78; 3:51.
46 *Ibid.*, 2:183; 3:78–9; 7:59–93; 19:54–5; 21:25; 23:52; 98:4–5.
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48 *Ibid.*, 2:75, 78–9; 11:110.

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75 *Quran*, 3:63; 9:31, 34. See nn. to these verses in M. Asad, *The Message of the Quran*; and M. Ali, *The Holy Quran*.

76 *Ibid.*, 4:78–9; 6:152–4; 16:53, 90–7.

77 *Ibid.*, 39:10;2:197–8; 3–136; 6:11; 12:109; 16:36; 22:45–6; 27:69; 29:20; 30:9, 42; 35:43; 40:21, 82; 73:20. The Quranic command to travel, and its institutionalisation in the annual pilgrimage to Mecca (Hajj) had the most profound effect on the genesis, growth, and diffusion of medieval Muslim science and learning, and the development of trade and industry, engineering and public works, navy and international relations. See G. Sarton, *Incubation of Western Culture in the Middle East* (Washington D.C.: U.S. Govt. Printing Office, 1952) pp. 21–2; O. Farrukh, pp. 52–4; S. H. Nasr, *Science and Civilisation in Islam* (Cambridge: Harvard Univ. Press, 1964), pp. 98–106, 108–16, 230–41.

78 *Quran*, 10:39.

79 *Ibid.*, 5:92; also 5:99; 6:52; 7:62, 68, 79, 93; 13:40; 16:35, 82; 88: 21–6.

80 *Ibid.*, 10–41; also 6:52, 136; 10:88; 11:93.

81 *Ibid.*, 6:108; also 6:66–7, 105; 10:108; 11:86; 42:6.

82 *Ibid.*, 2:256; also 6:105; 10:108; 73:19; 109:1–6.

83 *Ibid.*, 16:125; 42:15; 29:46.

84 *Ibid.*, 6:109; 49:11.

85 *Ibid.*, 42:10; also 5:48, 92, 99; 6:52, 109, 136; 9:94, 105; 10:41, 88–9; 11:93; 16:82, 92; 22:17, 67–9; 88:21–6.

86 *Ibid.*, 14:34; 16:18.

87 *Ibid.*, 10–99; also 6:105–8, 138, 149–50; 17:84; 42:8.

88 K. A. Hakim, in *University of Notre Dame, Natural Law Institute Proceedings*, pp. 45–8.

89 *Quran*, 2:11–12; 6:43, 109, 138; 8–48; 9–37; 13:33; 16:63.

90 S. M. Husain, 'Social Conditions under the Pious Caliphs', *Iqbal*, V (July, 1956), pp. 21–53, E. W. Lane in S. Lane-Poole (ed.), *Arabian Society in the Middle Ages: Studies from the Thousand and One Nights*, rev. ed. *passim* (London: Curzon Press Ltd, 1971), F. Rahman, *Islam* (New York: Holt, Rinehart and Winston, 1966), pp. 38–9, 231–2. Enslavement was permitted in the Quran only in the case of prisoners of war who too were to be freed, after cessation of hostilities, either as a favour or through a form of exchange like ransom, 47:4. Quranic ordinances are all for freeing slaves or prisoners, 2–177; 4–92; 5:89; 9:60 58:3; 90:13. They do not preach 'good treatment of slaves' for that would imply that slavery is on principle legitimate. Men should be given freedom before making efforts to improve their socio-economic conditions, 90:12–16. Nevertheless traditional Muslim societies made and maintained slaves under an elaborate Islamic law, A. A. B. al-Marghinani, *The Hedāya or Guide: a Commentary on the Mussulman Laws*, trans. by C. Hamilton, 2nd ed. *passim* (Lahore: Premier Book House, 1963). However, slaves and subject nations have historically

been treated better by Muslims than by non-Muslims, S. Ameer Ali, *Spirit of Islam*, pp. 258–67.

91 *Quran*, 95:4–6; 103:1–3; S. M. Iqbal, p. 81.

92 This is apparent from recent success in Islamic modernisation of personal and family law in many Muslim countries. M. Borramans, 'Codes Regulating Personal Status and Social Evaluation in certain Muslim Countries', *The Islamic Review* (Apr. to Dec., 1966); K. A. Faruki, 'Islamic Family Law in Pakistan in the Context of Modern Reformist Movement in the World of Islam', *The Islamic Review* (May and June, 1965).

93 Cf. G. F. Hourani, *Islamic Rationalism: The Ethics of Abd al-Jabbar* (Oxford: Clarendon Press, 1971), pp. 17–26; R. M. Chisholm, *Theory of Knowledge* (Englewood Cliffs: Prentice Hall Inc., 1966), especially chapter 4.

94 *Quran*, 4:82; also 47:24.

95 For historical Muslim understanding of relation between the insights of the Quran and pure reason, see M. Abduh, *Theology of Unity*, pp. 30–40, 107–8, 126–8; Farrukh, O., *Arab Genius*, pp. 103–110; S. M. Iqbal, chapter 1 and pp. 149–50, 167; M. H. Kerr, chapter 4, especially pp. 109–18. See also the section on Islamic classifications of knowledge in chapter 3.

96 *Quran*, 26:195; 44:58; also 43:3; 54:17, 22, 32, 40.

97 *Ibid.*, 39:23; 3:6. Cf. M. Ali, *Holy Quran*, nn. 387–9; M. Asad, *The Message of the Quran*, 3:7 nn. 5–8; K. A. Faruki, *Islamic Jurisprudence*, chapters 11–16, especially pp. 112–25.

98 M. Asad, *The Message of the Quran*, p. XV.

99 I. R. al-Faruqi, 'Towards a New Methodology for Quranic Exegesis', *Islamic Studies*, I (March, 1962), pp. 35–52. I. R. al-Faruqi, *On Arabism: 'Urubah and Religion* (Amsterdam: Djambatan, 1962), pp. 175–8.

100 J. M. Pfiffner and R. V. Presthus, *Public Administration*, 4th ed. (New York: Reynold Press Co., 1960), pp. 117, 121–23, 235ff.

101 *Quran*, 4:3, 129: K. A. Faruki, *The Islamic Review* (May and June, 1965), 10.

102 Cf. Ibn Khaldun, *Muqaddimah: An Introduction to History*, trans. with an introduction by Franz Rosenthal, Bollingen Series XLIII, 3 vols., 2nd ed. (Princeton: Princeton University Press, 1967), 1:9–11, 56–65, especially pp. 56–7, A. J. Toynbee, *A Study of History*, 1:1–16; 12:8–102. K. A. Faruki, *Islamic Jurisprudence*, pp. 46–52.

103 *Quran*, 20:114.

104 I. R. al-Faruqi, *Islamic Studies*, I (March, 1962), 47–9.

105 K. A. Faruki, *Islamic Jurisprudence*, chapters 5–10.

106 *Quran*, 5:109; 7:187–8; 80:1–12. A prophet is prevented from committing errors in conveying scriptural revelation, *ibid.*, 53:2–6; 3:78–80, 160; 4:64; 5:109, 116–17; 7:203; 10:15–16; 72:20–8. However, as a common man, a prophet is subject to human limitations, *ibid.*, 18:110; 21:7–8; 27:20; but through exemplary conduct the prophets rise to moral pre-eminence, *ibid.*, 33:21, 45–6; 34:50; 53:6–9; 68:4.

107 *Ibid.*, 2:134; 141, 286; 6:69–70, 165.

108 *Ibid.*, 5:48, 92, 99; 6:52, 57, 109, 136, 159–60; 9:94, 105; 10:41, 88; 11:93, 121–3; 16:82, 92; 20:135; 22:17, 67–9; 32:25; 39:7; 42:10; 88:21–6.

109 F. Rahman, *Islam*, pp. 128–9, 254, and chapters 8 and 9, (*passim*); S. M. Iqbal, pp. 20–1, 40–1, 100–3. For a survey on Sufi thought and leading Sufis of the first/seventh to twelfth/eighteenth century, see the various articles in M. M. Sharif (ed.), *A History of Muslim Philosophy*, 1:310–420, 2:820–82.
110 F. Rahman, 'Concept of *Hadd* in Islamic Law', *Islamic Review* (July and Aug., 1966), pp. 9–13; Abdur Rahim, *The Principles of Muhammadan Jurisprudence*, (Lahore: All Pakistan Legal Decisions, 1963), pp. 66–7, 201–4.
111 S. M. Iqbal, *Presidential Address: All India Muslim League, Allahabad Session, Dec. 1930* (Delhi: All India Muslim League, 1945), p. 14.
112 *Quran*, 6:2; 7:11, 12; 15:126; 22:5; 23:12; 32:7; 35:11; 55:14.
113 *Ibid.*, 6:166; 8:28; 10:4; 18:7; 21:35; 29:2–3, 10–11; 45:22; 47:31, 38; 67:2; 76:2–3.
114 *Ibid.*, 17:72.
115 *Ibid.*, 15:29; 7:140; 30:30; 32:9; 95:4.
116 *Ibid.*, 16:78; 32:9; 55:3–4; 67:23; 90:8–10.
117 *Ibid.*, 2:29, 57, 60, 168; 7:10; 55:10–13; 67:15.
118 *Ibid.*, 14:32–4; 16:5–18; 31:20; 45:12–13; 67:15.
119 *Ibid.*, 17:70; 2:30, 34; 7:11; 15:26–31; 91:7; 95:4.
120 *Ibid.*, 76:2–3; 5:48; 90:8–10; 11:118.
121 *Ibid.*, 2:30; 6:166.
122 *Ibid.*, 91:7–10.
123 *Ibid.*, 17:11; 21:37.
124 *Ibid.*, 3:179; 4:37; 9:34–5; 17:100; 47:8; 104:2–9; 89:17–20.
125 *Ibid.*, 20:115; 70:19–21.
126 *Ibid.*, 3:187; 4:36–7; 16:22–3, 29; 17:37, 83; 35:42–3; 40:83; 57:23–4; 75:31–6; 90:4–7.
127 *Ibid.*, 11:9–10; 16:53–5, 83; 17:83; 39:7–8; 40:61.
128 *Ibid.*, 24:41; 33:33.
129 *Ibid.*, 3:164; 4:79; 6:124; 9:44; 10:44; 11:101; 16:33–4, 118; 30:41; 42:30.
130 *Ibid.*, 3:13; 4:28.
131 *Ibid.*, 5:48–9, 77; 6:151; 7:176; 25:43; 45:18, 23–4; 57:20.
132 *Ibid.*, 57:27.
133 *Ibid.*, 2:143; 4:171; 22:78.
134 *Ibid.*, 7:32; 28:77; also 5:4–5, 87–8.
135 *Ibid.*, 4:97; cf. 42:39–43.
136 *Ibid.*, 4:97–100; 39:10; 16:41–2.
137 *Ibid.*, 28:77; 42:39; 3:171; 16:110.
138 *Ibid.*, 17:18–20.
139 *Ibid.*, 4:78–9; cf. 16:53–5.
140 *Ibid.*, 3:164; 6:42–5, 65; 7:130–41, 168; 10:44; 11:100–2; 16:33–4, 36, 112–13, 118; 30:9–10, 33–7.
141 *Ibid.*, 13:11; 8:53.
142 *Ibid.*, 5:78–9, 100; 6:69–70; 7:164–5; 8:25; 11:116; 33:64–7.
143 *Ibid.*, 13:17; 16:96.
144 *Ibid.*, 6:123–4; 2:243.
145 *Ibid.*, 10:23, 44; 11:101, 116–17; 42:30.
146 *Ibid.*, 14:22; 17:65; 37:30.

147 *Ibid.*, 75:14–15; 17:15.

148 S. Qutb, *This Religion of Islam*, chapter 5. S. Qutb, *Social Justice in Islam*, chapter 7. Islamic social justice was the primary cause for the rapid spread of Islam and its culture in the Middle Ages; 'Abduh, *Theology of Unity*, chapter 15; S. Ameer Ali, *Spirit of Islam*, Part I, chapters 6, 8 and 9, and Part II, chapters 4 and 7; S. Ameer Ali, *A Short History of the Saracens* (London: Macmillan & Co. Ltd, 1951), chapters 3 and 4; T. W. Arnold, *The Preaching of Islam: A History of Propagation of the Muslim Faith* (Lahore: S. M. Ashraf, 1957); S. Nu'mani, *Al-Farooq: Life of 'Umar, Second Caliph of Islam*, trans. by Z. A. Khan, vol. I, and M. Saleem, vol. II; 2 vols. (Lahore: S. M. Ashraf, 1961–2), vol. I (*passim*) vol. II, chapters 1 and 4, 14–16. One of the polemical tools used by the West to discredit Islam has been the allegation that Islam spread by the use of force, N. Daniel, *Islam and the West: The Making of an Image* (Edinburgh: Edinburgh Univ. Press, 1960), chapters 4 and 10.

149 *Quran*, 90:10; 76:3; 15:24; 1:5–7; especially *Surahs* chapters 76 and 90.

150 *Ibid.*, 3:179; 57:7, 10.

151 *Ibid.*, 13:22; also 4:95; 9; 44; 14:31; 61:11.

152 *Ibid.*, 4:75.

153 *Ibid.*, 2:44; 3:166; 4:77, 137–46; 9:43–110; 47:20; 61:2–3.

154 *Ibid.*, 2:62; 5:69.

155 *Ibid.*, 107:1–7.

156 *Ibid.*, 2:177; 22:37.

157 *Ibid.*, 4:36; cf. 2:177; 22:34–7; 30:38.

158 *Ibid.*, chapter 90.

159 *Ibid.*, 3:179; 2:268.

160 *Ibid.*, 3:101–4; 30:30–2; 49:10; 9:71–2; 5:55–6. From the brotherhood of real Muslims on the basis of their deeds are excluded the Muslim hypocrites, *ibid.*, 9:23, 67–9, 73, 140–5; 4:88–91; 66:9.

161 *Ibid.*, minimum common values are bases of co-operation with the followers of earlier prophets, 3:63; 29:46; 2:139; followers of religions should not make exclusive claims to success and prosperity here or in the hereafter, 2:94; 3:60; 5:18; 2:80–2, 111–13, 135; such success and prosperity should be open to all the believers in and doers of good, regardless of differences in theological inter-religion dogmas, 2:62, 177; 5:69. However, there should be no friendship or co-operation with the insincere, hostile, and malevolent people among followers of other religions, 5:41, 57–9, 82; 4:139, 144. Similarly the Muslim hypocrites are excluded from this multi-religious community of values, n. 160 above.

162 *Ibid.*, 5:48; 3:103, 109; 9:67, 71, 111–12; 49:9–10.

163 *Ibid.*, 3:177–8, 185; 6:42–5; 8:28; 11:116; 23:55–6; 63:29; 64:14–15.

164 *Ibid.*, 4:32; 6:166; 16:71, 75–6.

165 *Ibid.*, 3:187; 16:22–5; 17:4–10, 83; 35:42–4; 40:21–2; 82–5; 53:29–30; 90:4–7.

166 *Ibid.*, 19:77–8; 38:2; 90:4–7.

167 *Ibid.*, 9:38–9; 17:4–10; 22:39–41; 90:19.

168 *Ibid.*, 6:166; 10:13–14; 71–3; 18:7; 22:39–41; 45:27–35; 47:31; 76:1–3.

169 *Ibid.*, 22:40; cf. 57:25; 61:14.

170 *Ibid.*, 29:69; 53:39; 13:11.
171 *Ibid.*, 17:18–20; 16:33–4; 11:99–102; 10:33.
172 *Ibid.*, cf. I. R. al-Faruqi, *Intl. Philosophical Quart.*, VI (Sept. 1966), 368.
173 *Quran*, 47:38; cf. 6:6.

Chapter 2

1 M. Asad, *Principles of State and Government in Islam* (Los Angeles: Univ. Calif. Press, 1961), pp. 102, also 11; K. A. Faruki, *Islamic Jurisprudence*, pp. 30, also 11–19; S. Mahmassani, *Falsafat al-Tashri fi al-Islam: The Philosophy of Jurisprudence in Islam*, trans. by F. J. Ziadeh (Leiden: E. J. Brill, 1961), pp. 4–10.
2 The Muslim date begins from the *Hijra*, or Emigration of the Prophet Muhammad from Mecca to Medina in AD 622. BH and AH stand for before and after the *Hijra*. AH second/AD eighth century means the AH second and AD eighth centuries which overlap approximately.
3 S. Ramadan, *Islamic Law: Its Scope and Equity* (London: P. R. Macmillan Ltd, 1961), pp. 34, 42.
4 S. Mahmassani, *Falsafat*, pp. 16–17, 109–14, 117–19; S. Ramadan, *Islamic Law*, pp. 23–6.
5 A. A. Maudoodi, 'Abu Hanifah and Abu Yusuf', in *A History of Muslim Philosophy*, I:688–703.
6 S. Ameer Ali, *Spirit of Islam*, p. 436.
7 S. Mahmassani, *Falsafat*, pp. 36–7, 17–19, 24–7; cf. K. A. Faruki, *Islamic Jurisprudence*, pp. 22–5.
8 S. Mahmassani, *Falsafat*, pp. 26–31, 18–27; K. A. Faruki, *Islamic Jurisprudence*, pp. 25, 187–91; S. M. Iqbal, pp. 163–8.
9 S. M. Iqbal, pp. 149–53; cf. K. A. Faruki, *Islamic Jurisprudence*, 28 f; S. Mahmassani, *Falsafat*, pp. 92–9.
10 P. K. Hitti, *History of the Arabs*, 8th ed. (London: Macmillan & Co. Ltd, 1964), pp. 484–6, 470–3; S. Cobb, *Islamic Contributions to Civilisation* (Washington D.C.: Avalon Press, 1963), pp. 22–4, 35, 38.
11 P. K. Hitti, *History of the Arabs*, chapter 39; S. Ameer Ali, *Short History of the Saracens*, chapters 29 and 30.
12 P. K. Hitti, *History of the Arabs*, chapter 45; S. Ameer Ali, *Short History of the Saracens*, pp. 341–88 (*passim*).
13 A. S. Ahsan, 'Fall of the Abbasid Caliphate', in *History of Muslim Philosophy*, 2:789–95, also 1393 f. See also G. Sarton, *Introduction to the History of Science*, 3 (Part 2):1101–2, 1467–74; S. Ameer Ali, *Short History of the Saracens*, pp. 383 f, 391–400; P. K. Hitti, *History of the Arabs*, pp. 482–9, 699–702.
14 P. K. Hitti, *History of the Arabs*, pp. 672–4, 694 f, 549–51.
15 H. A. R. Gibb, *Ibn Batuta*, pp. 24 f, quoted in G. E. Kirk, *A Short History of the Middle East*, 7th rev. ed. (New York: F. A. Praeger, 1964) p. 54. Also M. W. Dols, *The Black Death in the Middle East* (Princeton: Princeton Univ. Press, 1977).
16 P. K. Hitti, *History of the Arabs*, p. 696.
17 P. A. Sorokin, *The Sociology of Revolution* (Philadelphia: J. B. Lippincott Co., 1925).
18 P. A. Sorokin, *Social and Cultural Dynamics*, 4 vols. (New York: American Book Co., 1937–41), 1:97–9, 4:45 ff, for definition of the compo-

nents and characteristics of socio-cultural systems referred to here.

19 M. A. Rauf, *A Brief History of Islam* (Kaula Lampaur: Oxford Univ. Press, 1964), p. 67.

20 S. M. Iqbal, p. 151. Cf. S. Ramadan, *Islamic Law*, pp. 70 f; S. Mahmassani, *Falsafat*, p. 93. This, we must admit, was the optimal strategy on the principle of minimax at that time. Deprived of the options of positive achievement, keeping at a minimum the disintegration of Islamic culture was the best that could be done, cf. M. Sasieni, A. Yaspan and L. Friedman, *Operations Research: Methods and Problems* (New York: John Wiley and Sons, 1963), pp. 155 f.

21 A. Shalaby, *Hstory of Muslim Education* (Beirut: Dar al-Kashshaf, 1954), pp. 37–74 (*passim*).

22 M. Nakosteen, *History of Islamic Origins of Western Education, AD 800–1350* (Bouldo: Univ. Colo. Press, 1964), pp. 41 f.

23 On decline in the Muslim world and renaissance from AH twelfth/AD eighteenth century onwards, see M. M. Sharif (ed.), *A History of Muslim Philosophy*, II, books seven and eight. See also below chapter 3, n. 86.

24 S. M. Iqbal, p. 173; S. Mahmassani, *Falsafat*, pp. 20, 31; K. A. Faruki, *Islamic Jurisprudence*, pp. 22–5, 34; A. A. Maudoodi, *History of Muslim Philosophy*, 1:685–90.

25 Cf. A. H. Kamali, '*Kitab al-Hiyal* in the Political Philosophy of the *Ummah*', *Iqbal Review*, VII (Oct., 1966), pp. 59–81; and C. L. Ostrorog, *The Angora Reform* (London: Univ. London Press Ltd, 1927).

26 M. Hidayatullah, *Principles of Mahomedan Law*, 16th ed. (Bombay: N. M. Tripathi Private Ltd, 1968), pp. XXV, XXVII–XXXI; N. J. Coulson, *A History of Islamic Law*, pp. 129, 132–4, 172, 184–201; S. Mahmassani, *Falsafat*, pp. 126–9; S. Ramadan, pp. 56–8; K. A. Faruki, *Islamic Jurisprudence*, p. 31; M. Hamidullah, 'Jurisprudence', in *History of Muslim Philosophy*, 2:1226 f.

27 H. Asad, *Principles*, pp. xi, 48, 106.

28 Serajul Haque, 'Ibn Taimiyyah', 2:796–819.

29 S. Ramadan, pp. 71–3; S. Mahmassani, *Falsafat*, pp. 51 f, 92–8; S. M. Iqbal, pp. 171–3, 129, 151 f; S. Mahmassani, 'Muslims Decadence and Renaissance; Adaptation of Islamic Jurisprudence to Modern Social Needs', *The Muslim World*, XLIV (1954), pp. 186–201; M. Abduh, *Theology of Unity*, p. 186.

30 M. Asad, *Principles*, pp. 100–2; K. A. Faruki, *Islamic Jurisprudence*, pp. 30–3.

31 K. A. Faruki, *Islamic Jurisprudence*, p. 33.

32 *Quran*, 4:60–1; 5:44–5, 47; also 5:48–9; 6:115; 7:2–3; 16:64.

33 *Ibid.*, 2:286; also 2:173, 185; 5:3, 6; 6:146; 16:114, 119; 22:78. Cf. S. Ramadan, pp. 57 f, 61; S. Mahmassani, *Falsafat*, pp. 152–5.

34 F. Rahman, *Islam*, pp. 3, 43–67. Cf. K. A. Faruki, *Islamic Jurisprudence*, pp. 60–2.

35 *Quran*, 3:132; 4:59, 64, 69, 80; 5:95; 8:20, 24, 27, 46; 9:71; 24:51–2, 54, 56; 47:32, 33; 54:12. See also S. Ramadan, pp. 33 f; F. Rahman, *Islam*, pp. 50 f; S. Mahmassani, *Falsafat*, p. 73.

36 K. A. Faruki, *Islamic Jurisprudence*, pp. 53–62, 126–39; S. Ramadan, pp. 34, 38 f; S. Mahmassani, *Falsafat*, p. 67; M. Hamidullah, review of *An*

Introduction to Islamic Law by J. Schact, *The Middle East Journal*, XIX (1966), pp. 238 f.

37 S. M. Iqbal, p. 171.

38 M. Asad, *Principles*, p. 104; cf. S. Ramadan, *Islamic Law*, pp. 66f.

39 A. M. Ibn Hisham, *The Life of Muhammad: A Translation of Ibn Ishāq's Sīrat Rasūl Allāh*, trans. by A. Guillaume (Lahore: Oxford Univ. Press, 1967), pp. 296 f, 454; cf. n. 4 above, and chapter I, n. 35.

40 S. Ramadan, *Islamic Law*, p. 67; cf. S. Mahmassani, *The Muslim World*, XLIV (1954), pp. 196–201.

41 *Quran*, 29:69.

42 S. M. Iqbal, p. 148.

43 These definitions are given by, respectively, F. Rahman, *Islam*, p. 72; S. Ramadan, *Islamic Law*, p. 64; M. Hamidullah, *Jurisprudence*, 2:1230; M. Asad, *Principles*, p. 14; K. A. Faruki, *Islamic Jurisprudence*, pp. 92, 26; S. M. Iqbal, p. 148.

44 K. A. Faruki, *Islamic Jurisprudence*, pp. 63, 140; S. Mahmassani, *Falsafat*, pp. 79 f.

45 M. I. al-Shafi'i, *Islamic Jurisprudence: Shaf'ī's Risāla*, trans. by M. Khadduri (Baltimore: Johns Hopkins Press, 1961), p. 288.

46 Cf. K. A. Faruki, *Islamic Jurisprudence*, pp. 148–50, 198–200, 243 f.

47 *Ibid.*, see chapter 3 below for detailed discussion.

48 *Ibid.*, pp. 67–71, S. Mahmassani, *Falsafat*, pp. 76 f.

49 M. Asad, *Principles*, p. 55.

50 *Quran*, 3:158; 42:38. Ibn Hisham, *Life of Muhammad*, pp. 235 f, 296 f, 454; S. Mahmassani, *Falsafat*, p. 129; M. Asad, *Principles*, pp. 54 f; S. Ramadan, *Islamic Law*, pp. 44, 66 f; M. Hamidullah, *The Muslim Conduct of State*, p. 23.

51 S. A. Husaini, 'The Shura', *The Journal of the Pakistan Historical Society*, III (Apr. 1955), pp. 155–62.

52 K. A. Faruki, *Islamic Jurisprudence*, p. 71; S. M. Iqbal, p. 173.

53 M. Asad, *Principles*, pp. 53–68; K. A. Faruki, *Islamic Jurisprudence*, pp. 152–65, 67–74, *passim.*

54 S. M. Iqbal, pp. 173–5; S. Ramadan, *Islamic Law*, pp. 74–89.

55 *Quran*, 5:101–2; 6:21, 94, 137–41, 145; 7:37; 16:116; *Message of the Quran*, trans. M. Asad, 5:101–2, nn. 120–3; M. Asad, *Principles*, pp. 14 f; S. Mahmassani, *The Muslim World*, XLIV (1954) 199 f; S. Ramadan, *Islamic Law*, pp. 56–9.

56 For some other *shari'a* principles, see M. Hamidullah, 'Sources of Islamic Law – A New Approach', *The Islamic Quart.*, I (AH 1374/AD 1954), pp. 205–11; S. Mahmassani, *Falsafat*, pp. 89–91, 119–26; M. Hamidullah, *Muslim Conduct of State*, pp. 35–7.

57 *Quran*, 6:84–91.

58 *Ibid.*, 24:2; 4:25; *Holy Quran*, n. 1736; al-Shafi'i, *Islamic Jurisprudence*, pp. 105 f, 137–9, 197–9; M. Ali, *The Religion of Islam*, pp. 752–8. For more on this source of law, see M. Hamidullah, 'Jurisprudence', pp. 2:1229; M. Hamidullah, 'Sources of Islamic Law', pp. 210 f; M. Hamidullah, *Muslim Conduct of State*, pp. 35–7; S. Mahmassani, *Falsafat*, pp. 15 f, 71; K. A. Faruki, *Islamic Jurisprudence*, pp. 21 f.

59 S. Mahmassani, *Falsafat*, pp. 85 f; K. A. Faruki, *Islamic Jurisprudence*, pp. 243–5.

60 *Quran*, 39:17–18; 92:6–10; 39:55; cf. 7:145–7; 16:96–7; 23:96; 29:7.
61 Cf. I. R. al-Faruqi, *Islamic Studies*, I (March, 1962), 47 f.
62 S. Ramadam, *Islamic Law*, p. 33; M. Asad, *Principles*, p. 12; F. Rahman, *Islam*, pp. 35–7; also n. 59 above.
63 S. Mahmassani, *Falsafat*, pp. 87–9; S. Ramadan, *Islamic Law*, pp. 86–9; K. A. Faruki, *Islamic Jurisprudence*, pp. 25, 244 f; *Encyclopaedia of Islam*, II (1927), s.v. '*Istislah*' and '*Istihsan*'.
64 *Quran*, 5:4–5, 87–8; 7:31–3.
65 M. Hamidullah, *History of Muslim Philosophy*, 2:1229.
66 M. Hamidullah, *The Islamic Quart.*, I (AH 1374/AD 1954), p. 209; also S. Mahmassani, *Falsafat*, pp. 130–6; M. Hamidullah, *Muslim Conduct of State*, pp. 35–7.
67 S. Ramadan, *Islamic Law*, p. 62; also K. A. Faruki, *Islamic Jurisprudence*, pp. 166–79, 195–224.
68 *Quran*, 7:157.
69 *Ibid.*, 4:24; 6:120; M. Hamidullah, *Muslim Conduct of State*, p. 35; S. Ramadan, *Islamic Law*, pp. 58 f.
70 M. Hamidullah, *Muslim Conduct of State*, pp. 32 f, 275–82; M. H. Kerr, pp. 80–102, especially 90 ff; S. Mahmassani, *Falsafat*, pp. 152–7, 109–19.
71 *Quran*, 2:173; also 5:3; 6:120, 146; 16:115; 24:33.
72 *Ibid.*, 2:185; also 19:97; 22:78; 44:58; 54:17, 22, 32, 40; 65:4, 7; 80:20; 94:5–6.
73 *Ibid.*, 7:157.
74 M. Asad, *Principles*, p. 13.
75 *Ibid.*, p. 15.
76 J. Schacht, *An Introduction to Islamic Law* (Oxford: Clarendon Press, 1964), pp. 110 f.
77 S. M. Iqbal, pp. 140–5. Iqbal presented these conclusions in 1930 after a life-long study of Islam. They are similar to the 'four guiding ideas' of G. Sarton presented in 1947 after a life-long study of the history of science and learning: the idea of unity; the humanity of science; the great value of Eastern thought; and the supreme need of toleration and charity. See G. Sarton, *Introduction to History of Science*, 3 (Part 1): 19–25. Cf. *Ibid.*, 1:29–31, where he discusses the 'three aspects of the fundamental unity of life': nature, science and mankind.
78 S. M. Iqbal, p. 168.

Chapter 3

1 S. H. Nasr, *Science and Civilisation in Islam*, pp. 60–64.
2 For a review of al-Ghazali's life, works, ideas, continued influence in the Muslim world, and his influence on Western thought, see the contributions of Professors Sheikh, Abdul Khaliq, Binder, Ulken, Sharif, and Qadir in M. M. Sharif (ed.), *A History of Muslim Philosophy*, 1:581–641, 774–87, and 2:1349–1416 (*passim*), especially 1381 f.
3 E. A. Myers, *Arabic Thought and the Western World in the Golden Age of Islam* (New York: F. Ungar Publ. Co., 1964), p. 43.

4 P. K. Hitti, *Makers of Arab History* (New York: St. Martin's Press, 1968), p. 147.
5 A. H. M. al-Gazhali, *Book of Knowledge*, a translation with notes of the *Kitāb al-'Ilm* of Al-Ghazali's *Iḥyā 'Ulūm al-Dīn* by N. A. Faris (Lahore: S. M. Ashraf, 1966), pp. 31–6, 49 f, 55–72, 99 f; also Abdul Khaliq, 'Al-Ghazali: Ethics', in *History of Muslim Philosophy*, 1:627–37. Al-Ghazali, *The Faith and Practice of al-Ghazali* (*Al-Munqidh min al-Dalal*) trans. by W. M. Watt (London: George Allen & Unwin Ltd, 1953) pp. 21–40, hereafter *al-Munqidh*.
6 Al-Ghazali, *Book of Knowledge*, pp. 46–8, 77–9.
7 *Ibid.*, pp. 37, 51, also p. 9.
8 *Ibid.*, pp. 36–40, 53 f; also al-Ghazali, *al-Munqidh*, pp. 32–6, 38 f.
9 Al-Ghazali, *Book of Knowledge*, p. 37.
10 *Ibid.*, pp. 10–29.
11 *Ibid.*, pp. 73–7, 50–3.
12 Al-Ghazali, *al-Munqidh*, pp. 31–3, 37 f; al-Ghazali, *Book of Knowledge*, pp. 52–4.
13 For a discussion of al-Ghazali's critique of the 'philosophers' see, M. Saeed Sheikh, 'Al-Ghazali: Metaphysics', in *History of Muslim Philosophy*, 1:592–616, especially 592 f, 596, and of Ibn Rushd's refutation of al-Ghazali's critique see, A. El-Ehwany, 'Ibn Rushd', in *History of Muslim Philosophy*, 1:545–47.
14 S. H. Nasr, *Science and Civilisation in Islam*, pp. 55 f, 312–21; H. Bammate, *Muslim Contribution to Civilisation* (Geneva: Islamic Centre, AH 1381/AD 1962), pp. 31, 35–9, *et passim*; G. Sarton, *Introduction to History of Science*, 2 (Part 1); 355–61.
15 M. Mahdi, *Ibn Khaldun's Philosophy of History* (London: George Allen & Unwin Ltd, 1957), pp. 94, also 95; A. El-Ehwany, *History of Muslim Philosophy*, 1:546 f.
16 M. Saeed Sheikh, *History of Muslim Philosophy*, 1:639 n. 68, citing Simon van den Bergh who translated Ibn Rushd's *Incoherence of the Incoherence*.
17 Al-Ghazali, *al-Munqidh*, pp. 41, 42, also 32–43.
18 Al-Ghazali, *Book of Knowledge*, pp. 50 f, 77, 98–101, 111. Cf. W. M. Watt, *Muslim Intellectual: A Study of al-Ghazali* (Edinburgh: Edinburgh Univ. Press, 1963), pp. 108–16.
19 For example, R. Wraith and E. Simpkins, *Corruption in Developing Countries* (New York: W. W. Norton & Co. Inc., 1963)
20 I. R. al-Faruqi, 'Science and Traditional Values in Islamic Society', pp. 244–6, reprinted in W. Morehouse (ed.), *Science and the Human Condition in India and Pakistan* (New York: Rockefeller Univ. Press, 1968), pp. 26 f.
21 G. Sarton, *Introduction to History of Science*, 1:21–9. See also S. H. Mellone, 'Scholasticism', in *Encyclopaedia of Religion and Ethics*, (1921).
22 M. Mahdi, *Ibn Khaldun's Philosophy*, pp. 27–62. We have relied heavily on this study for Ibn Khaldun's Islamic philosophy of knowledge and political sociology.
23 G. Sarton, *Introduction to History of Science*, 3 (Part 2): 1770 f.
24 A. J. Toynbee, *A Study of History*, 12 vols. (London: Oxford Univ. Press, 1934–61), 3:321 f.

25 Ibn Khaldun, *Muqaddimah*, 2:436–63; 3:3–110; M. Mahdi, *Ibn Khaldun's Philosophy*, p. 99 n.4.
26 Ibn Khaldun, *Muqaddimah*, 2:437, 424, also 419–24; M. Mahdi, *Ibn Khaldun's Philosophy*, p. 75.
27 Ibn Khaldun, *Muqaddimah*, 3:282 ff; 1:477 f. Cf. M. Mahdi, *Ibn Khaldun's Philosophy*, pp. 75 f.
28 Ibn Khaldun, *Muqaddimah*, 2:438, 1:473, 477.
29 *Ibid.*, 3:35; also Mahdi, *Ibn Khaldun's Philosophy*, pp. 78, 100 f.
30 Ibn Khaldun, *Muqaddimah*. 3:111, also 111–55.
31 *Ibid.*, 2:436, also 347, 411 ff, 434 f. Cf. M. Mahdi, *Ibn Khaldun's Philosophy*, pp. 73–5, especially for this translation.
32 Ibn Khaldun, *Muqaddimah*, 3:282.
33 *Ibid.*, 2:411–20, 424–33. Cf. M. Mahdi, *Ibn Khaldun's Philosophy*, pp. 76–80.
34 Ibn Khaldun, *Muqaddimah*, 3:252 f.
35 *Ibid.*, 2:413; M. Mahdi, *Ibn Khaldun's Philosophy*, p. 77, especially for this translation.
36 M. Mahdi, *Ibn Khaldun's Philosophy*, pp. 107–12, esp. p. 109 n.1 and p. 112 n.3. Cf. S. S. Nadvi, 'Muslims and Greek Schools of Philosophy', *Islamic Culture*, I (1927), 85–91.
37 Ibn Khaldun, *Muqaddimah*, 2:973, 981; 3:152–280; M. Mahdi, *Ibn Khaldun's Philosophy*, pp. 108 ff.
38 M. Mahdi, *History of Muslim Philosophy*, 2:972 f.
39 Ibn Khaldun, *Muqaddimah*, 3:138 f; M. Mahdi, *Ibn Khaldun's Philosophy*, pp. 79–81, 109 n.1.
40 Ibn Khaldun, *Muqaddimah*, 3:246 f, 252 f, 255.
41 *Ibid.*, 3:35, also 34–55.
42 *Ibid.*, 3:246–58, esp. 248; cf. M. Mahdi, *Ibn Khaldun's Philosophy*, pp. 109–112.
43 Ibn Khaldun, *Muqaddimah*, 3:249, 251.
44 Cf. *Quran* 3:103, 109, 113; 7:157; 9:67, 71, 112; 22:41; 31:17.
45 M. Mahdi, *History of Muslim Philosophy*, 2:979–83.
46 Ibn Khaldun, *Muqaddimah*, 3:134, 245 f, 270 f, 280.
47 M. Mahdi, *History of Muslim Philosophy*, 2:973; cf. M. Mahdi, *Ibn Khaldun's Philosophy*, pp. 63–132, where the ideas of Ibn Khaldun and Ibn Rushd are compared in copious notes.
48 See *Quran* 3:154; 4:157; 6:116, 148; 10:36, 60, 66; 45:24; 48:6, 12; 49:12; 53:23, 28 for condemnation of conjectures or mere imagination (*zann*) which are equated with falsehood and following low desires (*hawā'*) and contrasted with truth, knowledge, and conclusive authority. Beliefs and statements must be supported by *burhān*, *ibid.*, 2:111; 21:24; 27:64; 28:75. Cf. E. L. Grant and W. G. Ireson, *Principles of Engineering Economy*, 4th ed. (New York: Ronald Press Co., 1960), p. 3 f.
49 A. Shalaby, *History of Muslim Education*; M. Nakosteen, *History of Islamic Origins*, pp. 41 f, 52–5, 62, 184, 186, 190–3; S. H. Nasr, *Science and Civilisation in Islam*, pp. 59–91, 92 ff, 103–6, *et passim.*
50 M. Asad, *Principles*, pp. 13 f; cf. chapter II.
51 R. H. Geldern, in D. L. Sillo (ed.) *International Encyclopaedia of Social*

Sciences (Glencoe: Free Press, 1968) s.v. 'diffusion'; R. Naroll, in J. Gould and W. A. Kolb (eds.) (Glencoe: Free Press, 1964) s.v. 'diffusion'; R. Linton, 'Diffusion', in T. Parsons (ed)., *et al* (New York: Free Press, 1961), pp. 1371–80; H. G. Barnett, *Innovation: The Basis of Cultural Change* (New York: McGraw-Hill Book Co., 1953); also n. 52 below.

52 Ibn Khaldun, *Muqaddimah*, 1:299–302; al-Ghazali, *al-Munqidh*, pp. 27 f, 33 f, 39–42. For the negative and positive aspects of imitation, or 'mimesis', see A. J. Toynbee, *A Study of History*, 1:191 f, 426, 3:245–48, 373; 4:119–33; 7:507, 523–5, 752; 8:481 f, 580–623; 9:147–9, 449; on zealotism and 'Herodianism as negative concepts of imitation, see *ibid.*, 8:580–623. Also A. J. Toynbee, *Civilisation on Trial* (New York: Oxford Univ. Press, 1953), pp. 184–206.

53 Cf. G. Sarton, *Incubation of Western Culture in the Middle East*, pp. 29–32.

54 G. Sarton, *Introduction to History of Science*, 1:521, 523, 544, 587, 620; 2 (Part 1):113–17, 167–81, 282–86, 321, 338–49, 350–53; 2 (Part 2):491–95, 561–69, 716–24, 829–61; 3 (Part 1):67–71, 426–69; 3 (Part 2):1071–78, 1373–96, *et passim*; M. Nakosteen, *History of Islamic Origins*, pp. 13–36, 173–200, 277–94; E. A. Myers, *Arabic Thought and the Western World*, pp. 66–134; D. L. O'Leary, *Arabic Thought and its Place in History* (London: Routledge Kegan Paul Ltd, 1958) chapters 4, 10 and 11. For a review of the transmission of Muslim science to the West, through translations of Arabic books, in the AH ninth/AD fifteenth century, see G. Sarton, 'Arabic Science and Learning in the Fifteenth Century. Their Decadence and Fall', in *Homenaje a Millás-Vallicrosa*, 2:309–16. For the role of translations into Arabic in the genesis of medieval Muslim science, see n. 60 below.

55 C. A. Qadir, 'Decline in the Muslim World', in *History of Muslim Philosophy*, 2:1417.

56 G. Sarton, *Introduction to History of Science*, 1:707–09, 721–3, 563 f; *et passim*; S. H. Nasr, *Science and Civilisation in Islam*, pp. 45, 49–51.

57 L. Festinger, *A Theory of Cognitive Dissonance* (Evanston: Row, Peterson, 1957).

58 R. W. Southern, *Western Views of Islam in the Middle Ages* (Cambridge, Harvard Univ. Press, 1962); especially pp. 97, 106 f.

59 I. R. al-Faruqi, 'Science and Traditional Values in Islamic Society', *Zygon*, II (1967), reprinted in *Science and the Human Condition in India and Pakistan*, pp. 12 f.

60 M. Nakosteen, *A History of Islamic Origins*, pp. 20–35, 144–7, 205–7; G. Sarton, *Introduction to History of Science*, 1:521, 523, 527, 544, 549, 557f, 599, 600 f, 611, *et passim*; E. A. Myers, *Arabic Thought and the Western World*, pp. 7–10, 66–77. For the role of translations in rejuvenation of the medieval Christian West, see n. 54 above.

61 A. Shalaby, *History of Muslim Education*, pp. 181–7. See also chapter 1 n. 77.

62 Cf. E. Oteiza, 'A Differential Push-Pull Approach', in W. Adams (ed.), *The Brain Drain* (New York: Macmillan Co., 1968), pp. 120–34.

63 A. Shalaby, *History of Muslim Education*, pp. 57–69, 73 f, 87 f, 94–111, 116–19, 203–15; S. Ameer Ali, *Spirit of Islam*, pp. 360–98; S. Dedijer, in *The Brain Drain*, pp. 9–28; B. Thomas, in *The Brain Drain*, pp. 29–49.

The changes in the USA immigration laws in 1970, which enabled thousands of Third World nationals to settle permanently in the USA, followed intensive studies by various agencies of the US Government. These studies and the US Congress Hearings before enactment of the new laws bring out the intentions to promote the US national interest through the brain gain legislation. See the report of the inter-agency (USA) Council on International Educational and Cultural Affairs, *The International Migration of Talent and Skills: Proceedings of a Workshop and Conference* (Washington, D.C., June 14–15, 1966). See also G. Henderson, *Emigration of Highly-Skilled Manpower from the Developing Countries*, No. 3, United Nations Institute for Training and Research (New York: UNITAR, 1970).

64 Development economists are usually concerned with these issues. See G. K. Boon, *Economic Choice of Human and Physical Factors of Production* (Amsterdam: North-Holland Publ. Co., 1964); C. P. Kindleberger, *Economic Development*, 2nd ed. (New York: McGraw-Hill Book Co., 1965), pp. 249–68.

65 Mahboob ul-Haq, 'Wasted Investment in Scientific Research', in *Science and Civilisation in India and Pakistan*, pp. 126–32; C. H. G. Oldham, 'Science, Technology and Economic Development', *Science and Civilisation in India and Pakistan*, pp. 133–7; C. Nader, 'Technical Experts in Developing Countries', *Science and Technology in Developing Countries*, 447–91; W. Adams and J. B. Dirlam, 'An Agenda for Action', in *The Brain Drain* (New York: Macmillan Co., 1968), pp. 247–64, especially pp. 254–6.

66 For example, UNESCO, *Technical Education in the Arab States*; UNESCO and I.A.U., *Higher Education and Development in South-East Asia*, 3 vols. (Paris, 1967). Such studies neglect the main problem of educational reform, that is, the ideological content and curricula structure of technical education. The latter study does discuss language policy in South-East Asia, and this is also pin-pointed in UN Economic Commission for Africa, *Science and Technical Education in Africa*, E/CN.14/398. (April 20, 1967).

67 One such recent achievement are the papers and recommendations of the First World Conference on Muslim Education, Mecca, Saudi Arabia, AH 1397/AD 1977, organised by King Abdulaziz University. However, there is no implementation of these recommendations anywhere in the world even on a scale modest in relation to the magnitude of the problem of reconstruction of Islamic thought, re-training of teachers and professors, production of text books, and so on. For the objectives and recommendations, see the *Conference Book: First World Conference on Muslim Education* (Mecca and Jeddah: King Abdulaziz Univ., AH 1397/AD 1977). The papers contributed are being published, S. A. Ashraf (general ed.), *Islamic Education Series*, 7 vols. (UK: Hodder and Stoughton, and King Abdulaziz Univ., in press 1979).

68 S. W. A. Husaini, 'Humanistic-Social Sciences at King Abdulaziz University', and 'Humanistic-Social Sciences Studies in Higher Technical Education', *Social and Natural Sciences: The Islamic Perspective*, vol. 3, in I. R. al-Faruqi and A. O. Nasser (eds.), in *Islamic Education Series*, 7 vols. (UK: Hodder and Stoughton, and King Abdulaziz Univ., 1979).

69 UNESCO, J. Gould and J. H. Smith (eds.), *The Teaching of the Social Sciences in Higher Technical Education: An International Survey* (SS. 66/VIII. 1.1.14/A), (Paris: The UNESCO Press, 1968); and UNESCO, *Social Sciences and Humanities in Engineering Education*, Studies in Engineering Education, 2 (Paris: The UNESCO Press, 1974).
70 UNESCO, *Teaching of Social Sciences*, pp. 92–112.
71 *Ibid.*, pp. 109 f.
72 *Ibid.*, p. 108.
73 *Ibid.*, pp. 39–62, 75–91, 113–65. Cf. UNESCO, *Social Sciences and Humanities*, pp. 59–106.
74 UNESCO, *Teaching of Social Sciences*, pp. 136–65; American Society for Engineering Education, 'Liberal Learning for the Engineer: An Evaluation Five Years Later', in A. Giavininy (Project Director), *Engineering Education*, 65 (Jan. 1975), pp. 301–24. The other major studies on US engineering education include ASEE, *Final Report: Goals of Engineering Education*, vol. 59 (Washington D.C., Am. Soc. Engineering Education, Sept. 1968); review articles on the *Final Report*, in *Engineering Education*, September 1968; ASEE, 'Liberal Learning for the Engineer'.
75 American Association for Advancement of Science, *EVIST Resource Directory*.
76 T. Durdin, 'Teacher "a New Man" After Remoulding by Cultural Revolution', *The New York Times* (Apr. 30, 1971); 'Peoples' Republic of China – A Look Inside', *Civil Engineering* (Jan., 1977), pp. 61–5; 'After Chaos of Cultural Revolution Chinese Campuses Begin Long March Back to Normal', *Arab News* (Jeddah: Associated Press, Jan 14, 1979).
77 P. A. Sorokin, *Social and Cultural Dynamics*, 4:323–88, 145–96, especially 351–4.
78 See the works of Nakosteen, Nasr, and Shalaby cited in n. 49 above and n. 80 below.
79 Consequently, the renaissance of the religion, science and learning, art, and languages of the Christians, Jews, Zoroastrians and Sabians, living in the Muslim states was coeval with the rise and growth of the medieval Islamic civilisation itself. G. Sarton, *Introduction to History of Science*, 1:524, 550, 590 f, 623 f, 647, 653–55, 693–5, 700, 701 f, 745; E. J. Jurji, 'The Course of Arab Scientific Thought', in N. A. Faris (ed.), *The Arab Heritage* (Princeton: Princeton Univ. Press, 1974), pp. 221, 229 f, 238 f. However, after the initial rise and growth, these religions and civilisations disappeared or declined as they could not compete with Islam, and their followers embraced Islam after attaining heightened self-consciousness of ideological and ethical problems.
80 S. H. Nasr, *Science and Civilisation in Islam*, pp. 21 f, 25, 38–42, 59; S. H. Nasr, *An Introduction to Islamic Cosmological Doctrines* (Cambridge: Harvard Univ. Press, 1964). pp. 3–5, 7, 279–81.
81 S. H. Nasr, *Science and Civilisation in Islam*, pp. 41–59; 28 f, 38, 184, 322; M. Nakosteen, pp. 41, 54 f, 62.
82 S. H. Nasr, *Science and Civilisation in Islam*, pp. 27, 144, 337; S. H. Nasr, *Introduction to Islamic Cosmologicql Doctrines*, p. 277, *et passim*.
83 See national reports in UNESCO studies cited in n. 69, on U.S.A. in n. 74, and also D. W. Sallet, 'Education of the "Diplom Ingenieur"', *Engineering Education*, vol. 59 (June 1969), pp. 1105 f; A. C. Gross, 'Selected Aspects

of Engineering Education in Canada', *Engineering Education*, pp. 1110–12; and various articles in a special issue on 'International Engineering Education', *Engineering Education*, vol. 61 (Dec. 1970).

84 Washington University, St. Louis, Missouri, initiated two such programmes at the undergratuate and graduate levels, R. P. Morgan, 'An International Development Technology Centre', *Engineering Education*, vol. 60 (Nov. 1969), pp. 247–9. Stanford University made an effort in 1970 to organise a two-year graduate 'International Programme in Engineering Studies', through a judicious selection of courses already offered in various departments of engineering and the social sciences and humanities.

85 Cf. M. Hamidullah, *Muslim Conduct of State*, for the conclusions showing the link between the genesis and growth of Islamic science and civilisation and, on the other hand, the Islamic internal and international law concerning neo-Muslims and non-Muslims.

86 P. K. Hitti, *History of the Arabs*; pp. 475, 488, 679 f.

87 G. L. Lewis, *Turkey* (London: Ernest Bevin Ltd, 1957), p. 17 in *History of Muslim Philosophy*, 2:1394.

88 G. Sarton, *Incubation of Western Culture*, p. 28; G. Sarton, 'Arabic Science and Learning in the Fifteenth Century', 2:309–316; G. Sarton, 'Arabic Scientific Literature', 1:60.

89 G. Sarton, *Incubation of Western Culture*, p. 27; G. Sarton, 'Arabic Scientific Literature', S. Lowinger and J. Somogyi (eds.), *Ignace Goldziher Memorial Volume* (Budapest: Globus Nyomdai Muintezet, 1948), 1:59–61; see also n. 79.

90 G. Sarton, *Introduction to History of Science*, 1:16–17, 503; 2 (Part 1): 1–3, 98, 109, 321–30; 2 (Part):485, 709, 808 f, 815, 818. Cf. M. Nakosteen, pp. 173–200, 277–94.

91 For example, the works of S. H. Nasr in n. 82.

92 S. H. Nasr, *Science and Civilisation in Islam*, pp. 21–40.

93 P. A. Sorokin, *Social and Cultural Dynamics*, especially 1:97–9.

94 Cf. A. J. Toynbee, *Study of History*, on nemesis.

95 M. Djilas, *The New Class: An Analysis of the Communist System* (New York: F. A. Praegar, 1957); D. Apter, 'Political Religion in the New Nations', in C. Geertz (ed.), *Old Societies and New States: The Quest for Modernity in Asia and Africa* (New York: Glencoe Free Press, 1963), pp. 94–104; L. H. Gann and P. Duignan, *Burden of Empire* (New York: F. A. Praegar, 1967), pp. 383–98; G. Hunter, *New Societies of Tropical Africa* (London: Oxford Univ. Press, 1962), especially pp. 288f; S. M. Lipset, 'Political Cleavages in "Developed" and "Emerging" Polities', in E. Allardt and Y. Littunen (eds.), *Cleavages, Ideologies and Party Systems* (Helsinki: Academic Bookstore, 1963), p. 21–5; S. I. Keller, *Beyond the Ruling Elites* (New York: Random House, 1963), p. 274; Ibn Khaldun, *Muqaddimah*, 1:299 f; 58.

96 See nn. 62, 63.

97 The works cited in n. 65 show higher brain drain among students proficient in languages of countries in which they settled.

98 Cf. Ibn Khaldun, *Muqaddimah*, 2:267–69, *History of Muslim Philosophy*, 2, 'Fine Arts'.

99 C. Nader, pp. 447, *et passim*.

100 For example, Kindleberger, pp. 134–49; A. Pepelasis, *et al.*, *Economic Development: Analysis and Case Studies* (New York: Harper & Brothers, 1961), pp. 132–60; A. O. Hirschman, *Strategy of Economic Development*, pp. 7–10, 137f.
101 Cf. chapter 5, especially nn. 18, 17.
102 A. Shalaby, pp. 147–49; Nasr, *Science and Civilisation in Islam*, pp. 73f, Nakosteen, pp. 55, 58–61.

Chapter 4

1 *The Mejelle*, hereafter referred to as the *Majallah*; see also n. 11 below. For a survey of water laws in Muslim countries around 1951, and of water laws of classical Muslim schools of law, see D. A. Caponera, *Water Laws in Moslem Countries, FAO Development Paper No. 43 (Rome: United Nations, FAO, 1954).*
2 A cubit, or *arshun*, equals about 0.758 metre, D. A. Caponera, p. 97.
3 Yahya b. Adam, in A. Ben Shemesh (ed.), *Kitāb al-Kharāj (Taxation in Islam)* vol. I (Leiden: E. J. Brill, 1958), pp. 72 f, 65 f; cf. D. A. Caponera, pp. 14–18.
4 *Quran*, 3 : 179; 57 : 7, 10; cf. chapter I; Adam, p. 123, and the traditions 'On Public Lands'.
5 Qudama b. Jafar, *Kitāb al-Kharāj*, vol. II (Leiden: E. J. Brill, and London, Luzac & Co. Ltd, 1965), pp. 63 f; Adam, pp. 73 f; D. A. Caponera, p. 31; cf. *Majallah*, Arts. 1282–8, 1290–1.
6 Jafar, p. 63.
7 Adam, pp. 76 f, 69, 62, 123; cf. D. A. Caponera, p. 18.
8 Jafar, pp. 60–4; cf. Adam, pp. 71–7; cf. *Majallah*, Arts. 1321 f, 1326. See chapter 2 on evolution of *fiqh*.
9 Adam, p. 78. Another variant of this Tradition was quoted in chapter 2.
10 *Quran*, 16 : 116. See also chapter 2, n. 30.
11 For a review of the organisation, contents, characteristics and limitations of the *Majallah*, see M. Mahmassani, *Falsafat*, in *The Law in the Middle East* pp. 21 f, 42–7; S. S. Onar, 'The Majalla', pp. 292–308.
12 *The Majallah*, pp. 3–15; M. Mahmassani, *Falsafat*, pp. 133–6, 152–8, 200–7, *et passim*. Mahmassani also discusses similarity of *Majallah* maxims with Western laws, and the relation between Islamic and Hebrew, Roman, and Western jurisprudence, *ibid.*, pp. 149–52, 136–45. Translations of *Majallah* Arts. are taken either from the *Majallah* or Mahmassani.
13 This, indeed, is also the problem of groundwater laws in the USA. 'Much of the confusion in legal interpretation of groundwater dates from the past when groundwater was only imperfectly understood.' D. K. Todd, *Ground Water Hydrology* (New York: John Wiley & Sons, Inc., 1963), p. 300.
14 *The Majallah*, Art. 906; also Arts. 881–925, 1199–1233. cf. M. Mahmassani, *Falsafat*, pp. 157 f, and S. S. Onar, pp. 303 f.
15 *Quran*, 59 : 7.
16 'The benefits to whomsoever they may accrue are in excess of the estimated costs' is the standard for evaluation of water development projects set forth in the Flood Control Act of 1936, USA.
17 *Quran*, 2 : 279. Cf. the Saying of the Prophet Muhammad: 'No damage and no mutual infliction of damage in Islam', Adam, p. 70.

18 *Quran*, 6:165; 17:15; 35:18; 39:7; also 53:38.
19 *Ibid.*, 53:39.
20 *Ibid.*, 4:32; also 2:286.
21 The *Majallah*, Arts. 919, 964, 1216. Cf. M. Mahmassani, *Falsafat*, pp. 157–9.
22 Cf. M. Hamidullah, 'Jurisprudence', 2:1230; M. Mahmassani, *Falsafat*, pp. 126–9.
23 Cf. A. Maass, *et al.*, *Design of Water Resources Systems* (Cambridge: Harvard Univ. Press, 1962), especially chapters 2 and 3; R. R. Lee, *Local Government Public Works Decision-Making* (Stanford: Institute in Engineering Economics Systems, Stanford University, 1964), pp. 10 ff; L. D. James and R. R. Lee, *Economics of Water Resources Planning* (Bombay: Tata McGraw-Hill Publ. Co. Ltd, 1971), chapters 18–21.
24 R. K. Linsley, US Senate, *Hearings on S. 3107, National Water Commission*, pp. 68–73.
25 UN, ECAFE, *Proceedings of the Regional Technical Conference on Water Resources Development in Asia and the Far East*, Flood Control Series, No. 9 (Bangkok, 1956), pp. 418–19; UN, ECAFE, *Proceedings of the Fourth Regional Technical Conference on Water Resources Development in Asia and the Far East*, pp. 52 f, 61–97.
26 A. Maass, *et al.*, *Design of Water Resource Systems*; L. D. James and R. R. Lee, *Economies of Water Resources Planning*.
27 *Quran*, 2:263; 3:103, 109, 113; 7:157; 9:67; 71, 112; 22:41; 31:17; 33:6, 32; 47:21; 65:2, 6, for *al-ma'rūf* as exhortations; and 2:178, 180, 228 f, 231–6, 240 f; 4:5 f, 8, 9, 19, 25, 114; 24:53; 31:15; 60:12, where the *ma'rūf* are prescribed as *shari'a* laws.
28 M. Mahmassani, *Falsafat*, p. 132.
29 *The Majallah*, Arts. 5, 7, 14, 37, 38, 41–3, 45; cf. M. Mahmassani, *Falsafat*, pp. 91 f, 130–6, 114–19.
30 D. A. Caponera, pp. 52–195.
31 UN, ECAFE, *Water Legislation in Asia and the Far East, Part I*, Water Resources Series, No. 31 (New York, 1968), pp. 1–12, 67–80; UN, ECAFE, *Water Legislation in Asia and the Far East, Parts 2(a) and 2(b)*, Water Res. Ser., No. 35 (New York, 1968), pp. 177–98 (*passim*).
32 UN, ECAFE, *Water Legislation, Part I*, pp. 217–27.
33 See works cited in nn. 23 and 25 above.
34 *Quran*, 6:71–84.
35 Bakhtiyar H. Siddiqi, 'Ibn Tufail', in *History of Muslim Philosophy*, 1:528–32; H. Z. Ulken, 'Influence of Muslim Thought on the West. Philosophical Influence in the Post-Kantian Period', in *History of Muslim Philosophy*, 2:1387 f; G. Sarton, *Introduction to History of Science*, 2 (Part 1): 354 f.
36 UN, ECAFE, *Water Legislation, Parts 2(a) and 2(b)*, p. 211.
37 *Quran*, 2:280.
38 *Partners in Development: Report of the Commission on International Development*, L. B. Pearson (chairman). Prepared for the International Bank for Reconstruction and Development (New York: F. A. Praegar Publ., 1968), pp. 72–6, 139–41, 153–67, especially pp. 154, 164.
39 *Quran*, 16:67; 2:219; 4:43; and 5:90 corresponding to the last four stages

of prohibition of intoxicants; M. Ali, *The Religion of Islam*, p. 738. Cf. K. A. Faruki, *Islamic Jurisprudence*, pp. 122–5.

40 UN, ECAFE, *Water Legislation, Parts 2(a) and 2(b)*, p. 226.

41 D. A. Caponera, pp. 37, 80.

42 K. A. Faruki, *Ijma' and the Gate of Ijtihād* (Karachi: Gateway Publ., AH 1373/AD 1964), pp. 21–9. See also chapter 2.

43 *Ibid.*, pp. 30–8; also chapter 2, n. 54.

44 This has been suggested by D. A. Caponera, pp. 50 f. On the limitations of historical precedents, see M. Asad, *Principles*, pp. 22 ff.

45 Cf. M. Mahmassani, *Falsafat*, pp. 159–67.

Chapter 5

1 *Quran*, 3:103, 109, 113; 9:71, 112; 22:41; 31:17.

2 E. I. J. Rosenthal, *Political Thought in Medieval Islam* (Cambridge: Cambridge Univ. Press, 1958), p. 53; cf. Ibn Khaldun, *Muqaddimah*, 1:322–27.

3 *Quran*, 11:59; 14:15.

4 S. M. Iqbal, p. 155. Despite the lessons learnt from the inaction and helplessness of Christian churches against the Nazis and Fascists in recent times, A. J. Toynbee, *A Study of History, passim*; the Western mind does not often appreciate the integration of politics and religion in Islam, and the career of the Prophet Muhammad, *ibid.*, 3:466–72; 12:461–76. Islamic jurist-politicians have ever been in the vanguard of struggles for social justice and the political rights of man, often leading to their incarceration, exile, martyrdom, or rise in political power. This Islamic spirit of political activism has moderated tyrants, cut short their careers, brought about a change of heart in erring Muslim ruling elites, and maintained the rule of Islamic law and ethics, more or less, wherever Muslims have lived. This is apparent from the struggles and sacrifices of the *Ikhwan al-Muslimin* (The Muslim Brotherhood Organisation) in Egypt during the dictatorship of the late President Gamal Abdul Nasser who had the full support of the Marxist and Western powers to suppress Islam and persecute the Muslims, see R. P. Mitchell, *The Society of the Muslim Brothers* (London: Oxford Univ. Press, 1969). The recent trials and triumphs of the Islamic movement under the Ayatollah Rohani Khomeini in Iran are another example.

5 UNESCO, C. F. Ware, K. M. Panikkar and J. M. Romein (eds.), *History of Mankind*, 6 vols; vol. VI: *The Twentieth Century* (New York: Harper & Row, 1966), p. 851; cf. pp. 879–85, 846–55 (*passim*).

6 Cf. 'cultural relativism' in chapter 7, n. 5, and the opposite concept of ethnocentrism discussed below in n. 52.

7 R. McKeon (ed.), *Democracy in a World of Tensions* (Chicago: Univ. Chicago Press, 1951), pp. 511 f. In this symposium prepared by the UNESCO to conduct a 'philosophically detached debate', p. 514, and 'to include all significant shades of doctrinal differences as well as to represent as many nations, cultures, and regions of the world as possible', p. x; the frame of reference of the questionnaire and the published responses excluded Islamic political thought.

8 For references to the *Quran*, and to a lesser extent the *Sunnah*, see the

works of A. A. Maudoodi, M. Asad, and H. K. Sherwani cited in n. 9 below.

9 A. A. Maudoodi, *History of Muslim Philosophy*, 1:191–4; M. Asad, *Principles*, pp. 34 f, 37–9; H. K. Sherwani, *Studies in Muslim Political Thought and Administration*, 4th rev. ed. (Lahore: S. M. Ashraf, 1965), pp. 23–6, 255 f, 259–73.

10 Cf. H. A. R. Gibb, *Studies on the Civilisation of Islam* (Boston: Beacon Press, 1962), p. 200; Rosenthal, *Political Thought*, pp. 116 f, 156, 176, 181.

11 However, the *sharī'a* is subject to review through reinterpretation of its sources, the Quran and the 'legal, binding *Sunnah*'; this is called *ijtihād fi al-sharī'a*. Thus it is the text of the Quran which is inviolable and immutable.

12 M. Asad, *Principles*, pp. 36, 43–6, 75–81; A. A. Maudoodi, *History of Muslim Philosophy*, 1:194 ff; H. K. Sherwani, pp. 29 f, 253 f, 269 f; M. Ahmed, '*Shūrā, Ijtihād and Ijmā'* in the Early Islamic State', *[Karachi] University Studies* (Apr., 1964), I, 46–61.

13 For the concept of 'government by seizure', particularly of al-Mawardi (d. AH 450/AD 1056), see H. A. R. Gibb, *Studies on the Civilisation of Islam*, pp. 162–4; cf. E. I. J. Rosenthal, *Political Thought*, pp. 45 ff, 51, 153 (usurpation), and 135 f, 153 f, 195, 278 nn. 68–9 (*taghallub*, tyranny or despotism), *et passim*; M. Q. Khan, 'Al-Mawardi,' 1:730. On incompatability of rightist or leftist illegal regimes with *sharī'a* democracy, see M. A. Ahmad, 'Khilafat and Dictatorship,' *[Karachi] University Studies* (Apr., 1967), 4, 1–26.

14 A. A. Maudoodi, 'Economic and Political Teachings,' 1:195; M. Asad, *Principles*, pp. 83–94.

15 *Quran*, 3:85–9; 16:106–9; 2:217; 5:54; 6:160; cf. chapter I nn. 81–91 and the text.

16 *Ibid.*, 6:109, 138; 29:46; 42:15; 16:125; 49:11; 5:48–9.

17 *Ibid.*, 2:189; 24:27; 49:12. Cf. the views of many Islamic jurists and political philosophers such as al-Ghazali and Nizam al-Mulk Tusi (d. AH 485/AD 1092), H. K. Sherwani, *Studies*, pp. 129 f, 162 f; E. I. J. Rosenthal, *Political Thought*, pp. 76 f, 222, 256 n. 59, 257 n. 85.

18 M. Asad, *Principles*, pp. 69–81; A. A. Maudoodi, 'Economic and Political Teachings,' 1:193–7.

19 S. Ramadan, pp. 103–53, especially 133–5; M. Asad, *Principles*, pp. 39–42, 61–3, 74 f; A. A. Maudoodi, *History of Muslim Philosophy*, 1:197.

20 All historical Muslim world-states, following the *sharī'a* dictates on religious and ideological pluralism, provided institutional opportunities for non-Muslim communities to live as autonomous 'nationalities' within the Islamic state. Therefore, the Islamic state is the only valid model for the future one-world state, A. J. Toynbee, *Change and Habit: The Challenge of our Time* (London: Oxford Univ. Press, 1966), pp. 184–95.

21 M. Asad, *Principles*, pp. 47–57, 69 f, 81–3, especially 48, 55; cf. chapters 1 and 2. For discussion on *sharī'a* value of the types and functions of intra-Muslim and inter-cultural dissent, see K. A. Faruki, *Islamic Jurisprudence*, pp. 166–241.

22 M. Asad, *Principles*, pp. 51–68.
23 *Ibid.*, pp. 24–9, 52–7, 92–4; A. A. Maudoodi, *History of Muslim Philosophy*, 1:659–65. Cf. S. Qutb, *Social Justice in Islam*, pp. 175–97, 87–99.
24 E. I. J. Rosenthal, *Political Thought*, pp. 113–18. For a critique of the third group who undermined Islamic constitutional theory by collaborating with illegal regimes by invoking the principles of necessity and constraint (chapters 2 and 4) as expedients (*ḥiyal*), see A. H. Kamali, *Iqbal Review*, 7:59–81.
25 Cf. M. M. Sharif (ed.), *History of Muslim Philosophy*, II, Book Eight; M. H. Kerr, *Islamic Reform*; R. P. Mitchell, *The Society of the Muslim Brothers*; E. I. J. Rosenthal, *Islam in the Modern National State* (Cambridge: Cambridge Univ. Press, 1965).
26 Thus Ibn al-Muqaffa (d. AH 142/AD 759) differentiated between three kinds of rule: those based on religion, on the will to power, and on arbitrary rule. Ibn al-Tiqtaqa, writing in AH 701/AD 1301–2, discussed mixed regimes, such as that of the Umayyads, which combined Islam and Kingship (*dīn* and *mulk*), E. I. J. Rosenthal, *Political Thought*, pp. 71, 250 n. 13. Ibn Khaldun's views on the *sharī'a* regime and the qualifications of the caliph conform with the orthodox formulations presented by al-Baghdadi (d. AH 429/AD 1037) and al-Mawardi (d. AH 450/AD 1058), M. Mahdi, *Ibn Khaldun's Philosophy of History*, pp. 241–4, especially nn.; M. Q. Khan, 'Al-Mawardi', *History of Muslim Philosophy*, 1:717, especially 719; H. K. Sherwani, *Studies*, pp. 99–112.
27 Cf. H. A. R. Gibb, M. M. Rabi, *The Political Theory of Ibn Khaldun* (Leiden: E. J. Brill, 1967), pp. 24–6, *et passim.*
28 M. Mahdi, *Ibn Khaldun's Philosophy*, pp. 264 f; M. M. Rabi, pp. 141 f, 168; Ibn Khaldun, *Muqaddimah*, 1:385–87.
29 *Asabiyya* has been understood as power group, social solidarity, group feeling, nationalism, 'blind support of one's group without regard for the justice of its cause'. For its Islamic and un-Islamic characteristics, and Ibn Khaldun's concept, see M. M. Rabi, pp. 48–69; Ibn Khaldun, *Muqaddimah*, 1:1xxviii ff, 1xxxii f.
30 Ibn Khaldun, *Muqaddimah*, 1:385.
31 *Ibid.*, 477 f; cf. M. Mahdi, *Ibn Khaldun's Philosophy*, pp. 244–8, for Ibn Khaldun's recognition of the theoretical possibility of regimes based on Jewish and Christian scriptures.
32 *Ibid.*, 1:386, 387.
33 *Ibid.*, 1:387. Ibn Khaldun quotes the *Quran* 30:7, 'They know the outward of this world's life, but of the Hereafter they are heedless'. Cf. M. Mahdi, *Ibn Khaldun's Philosophy*, pp. 277–9.
34 M. Mahdi, *Ibn Khaldun's Philosophy*, pp. 248–51.
35 Ibn Khaldun, *Muqaddimah*, 2:138.
36 *Ibid.*, 1:387.
37 M. Mahdi, *Ibn Khaldun's Philosophy*, pp. 251 f.
38 Ibn Khaldun, *Muqaddimah*, 2:138 f.
39 M. M. Rabi, pp. 92–113, 127–36; M. Mahdi, *Ibn Khaldun's Philosophy*, pp. 236–48, 263, 267 f, 276, 280–4.
40 Ibn Khaldun, *Muqaddimah*, 1:386, 322–7.

41 *Ibid.*, 2:138; also 1:385–8; 2:137–9, 300.
42 *Ibid.*, 1:426, 427; M. M. Rabi, *Ibn Khaldun's Theory*, pp. 150–4.
43 M. Mahdi, *Ibn Khaldun's Philosophy*, p. 248; Ibn Khaldun, *Muqaddimah*, 1:415.
44 Ibn Khaldun, *Muqaddimah*, 1:307; M. Mahdi, *Ibn Khaldun's Philosophy*, p. 278.
45 Ibn Khaldun, *Muqaddimah*, 1:448–65. Cf. I. M. al-Husayni, 'The Institution of the *Hisbah* in Early Islam', *The Islamic Review and Arab Affairs* (Feb., 1969) pp. 30–6.
46 Ibn Khaldun, *Muqaddimah*, 2:3–46.
47 *Ibid.*, 1:385–92 (*passim*), 430, 431; *et passim*; M. Mahdi, *Ibn Khaldun's Philosophy*, pp. 241 f.
48 Ibn Khaldun, *Muqaddimah*, 1:394–402; M. Mahdi, *Ibn Khaldun's Philosophy*, p. 242; see n. 26 above for al-Mawardi's views on the duties and qualifications of the caliph.
49 Cf. H. A. R. Gibb, pp. 166–75; E. I. J. Rosenthal, 'Ibn Khaldun', especially p. 320.
50 R. A. Dahl, *Modern Political Analysis* (Englewood Cliffs: Prentice-Hall Inc., 1963), pp. 25–38; G. A. Almond and G. B. Powell, Jr., *Comparative Politics: A Developmental Approach* (Boston: Little, Brown and Co., 1966); G. A. Almond and J. S. Coleman (eds.), *The Politics of the Developing Areas* (Princeton: Princeton Univ. Press, 1960).
51 This is an unforgivable disservice to the cause of scholarly objectivity when even the UNESCO sponsored studies do not give equal space to present the Islamic and other viewpoints, and adopt an exclusively Western 'ethnocentric orientation' (see below n. 52). See also n. 7 above for a critique of a UNESCO study; also UNESCO, *History of Mankind*, 6:788–827, especially the critique from the Russian viewpoint by A. E. Bovin, pp. 819–27.
52 For example, W. Z. Laqueur (ed.), *The Middle East in Transition: Studies in Contemporary History* (New York: F. A. Praegar, 1958); J. C. Hurewitz, *Middle East Politics: The Military Dimension*, Council on Foreign Relations (New York: F. A. Praegar, 1969); J. H. Kautsky (ed.), *Political Change in Underdeveloped Countries: Nationalism and Communism* (New York: John Wiley & Sons, Inc., 1966). Ethnocentrism is 'the feeling that one's own culture is the best in all respects and that others are in varying degrees inferior – barbaric, heathen, or outlandish'. Such value-judgements are incompatible with 'cultural relativism' (chapter 7, n. 5); and the ethnocentric also suppresses and passively rejects viewpoints besides those of his own culture. L. Broom and P. Selznick, *Sociology* (New York: Harper & Row, 1963), p. 57.
53 G. A. Almond and J. S. Coleman (eds.), pp. 3–64, 53–5.
54 G. A. Almond and J. S. Coleman (eds.), pp. 532–76.
55 G. A. Almond and G. B. Powell, pp. 214–18.
56 Secularism as a social philosophy seeks human improvement by means of reason, science, and social organisation; proclaims freedom of thought and research in every field by unfettered reason, with no penalty whatever for any criticism or investigation; and points up man's duty to study natural laws and live by them. S.v. 'Secularism', *Encyclopaedia of Religion and Ethics*, II (1921), 347–50. These are also the social principles of normative Islam which historical Muslim states realised better than any non-Muslim

state. Therefore, Islamic scholars contend that Muslims do not need secularism. Secularism is associated philosophically and historically with atheism. The moderate secularism of George J. Holyoake, prevailing now in the West and Westernised countries, neither accepts nor rejects but merely ignores religion (for example, Christianity), as being irrelevant in matters of state (*ibid.*). This is logically and philosophically untenable with any theism, and diametrically in opposition to Islam, since one cannot affirm the existence of God while denying Him jurisdiction in societal affairs. Secularism is, therefore, 'a grandiose and systematic hypocrisy', Fazlur Rahman, '1963 Iqbal Day Address', quoted by G. Mojtabai, 'Secularism, Science, and the West', *Ummah*, II (May, 1965), 28; cf. W. C. Smith, *Islam in Modern History* (Princeton: Princeton Univ. Press, 1957), pp. 23–6. Ibn Khaldun's typology of states and political cultures is, in effect, an Islamic critique of secularism. For modern Muslim critiques of secularism, see M. Asad, *Principles*, pp. 4–10; S. M. Iqbal, pp. 153–7, 9f; K. A. Hakim, *Islamic Ideology*, 3rd ed. (Lahore: Institute of Islamic Culture, 1965), pp. 195–204, 230–43; S. Qutb, *Social Justice in Islam*, pp. 1–16; S. H. Nasr, *Islamic Studies*, pp. 14–25; I. R. al-Faruqi, *On Arabism: 'Urubah and Religion* (Amsterdam: Djambatan, 1962). On secularism as a reaction against Christianity's ethos of asocietism, sin, and saviorism, and the modern trends in Christian thought towards societism, see I. R. al-Faruqi, *Christian Ethics: A Historical and Systematic Analysis of its Dominant Ideas* (Montreal: McGill Univ. Press, 1967).

57 *Dastur*; A. A. al-Marayati, *Middle Eastern Constitutions and Electoral Laws* (New York: F. A. Praegar, 1968).

58 Ibn Khaldun classified the historical Muslim states as mixed regimes. The transformations in its political culture and institutions made the caliphate, first, a mixed regime when 'caliphate and royal authority (rational regime) existed side by side'; and 'then, the characteristic traits of the caliphate disappeared, and only its name remained. The form of government came to be royal authority pure and simple.' Ibn Khaldun, *Muqaddimah*, 1:427, also 1:392, 426–9, 459; 2:139–56. Cf. M. M. Rabi, pp. 92–113, 127–36, *passim*; M. Mahdi, *Ibn Khaldun's Philosophy*, pp. 252f.

59 Ibn Khaldun, *Muqaddimah*, 1:427.

60 A good review of this genre of Muslim political thought is given by F. R. C. Bagley in his Introduction to his translation of al-Ghazali, *Counsel for Kings*, and by M. R. Hassan, 'Nizam al-Mulk Tusi', *History of Muslim Philosophy*, 1:747–74. They also point out the deviations of the 'Mirrors' from the theory of *shari'a* state. See also E. I. J. Rosenthal, *Political Thought*, pp. 62–83, and H. K. Sherwani, *Studies*, pp. 87–99, 112–34.

61 N. Machiavelli, *The Prince*, trans. by L. Ricci, rev. by E. R. R. Vincent (New York: New Amer. Library, 1952). In his laudatory 'Introduction' Christian Ganss shows that *The Prince* has a 'history of study and use by a long line of kings and ministers' in the West. It was Mussolini's subject for his doctorate thesis, 'it was Hitler's bedside reading', and 'Lenin and Stalin as well have gone to school to Machiavelli', p. 8.

62 The following discussion is summarised from Arne Naess and Stein Rokkan, 'Analytical Survey of Agreements and Disagreements', in *Democracy in a World of Tensions*, pp. 447–512.

63 According to the agreed definition of democracy in the UNESCO survey,

Lincoln would not be a democrat since for him 'the people' were only the Anglo-Saxon whites. Lincoln asserted that he was 'not, nor ever have been, in favour of bringing about in any way the social and political equality of the white and black races'. Nicolay and Hay (eds.), *Abraham Lincoln: Complete Works* (The Century Co., 1894), 1:273, also pp. 369, 370, 457, 458; *The New York Daily Tribune*, August 15, 1862, p. 1; Roy P. Basler (ed.), *The Collected Works of Abraham Lincoln*, 3:399, quoted in the *San Francisco Chronicle*, July 14, 1964, p. 15, where the white supremist racists claimed Lincoln as one of themselves.

64 Quoted in *Democracy in a World of Tensions*, p. 516.

65 This is the essence of Western political democracy. R. A. Dahl and C. E. Lindblom, *Politics, Economics and Welfare* (New York: Harper & Brothers, 1953); C. E. Lindblom, *The Intelligence of Democracy: Decision-Making Through Mutual Adjustment* (New York: Free Press, 1965); G. Schubert, *The Public Interest* (Illinois: Free Press of Glencoe, 1960).

66 Cf. G. Schubert, pp. 212–14. We must look for the philosophical roots of this amoral procedural formalism in 'ethical relativism' and 'conventionalism'.

67 B. Horvath, in *Democracy in a World of Tensions*, p. 99.

68 H. Kabir, in *Democracy in a World of Tensions*, p. 127.

69 S. Qutb, *Social Justice*, pp. 259f, 263–7, 270f; M. H. Kerr, *Islamic Reform*, pp. 87, 117, 80–102 (*passim*).

70 Cf. chapter 7. For a typology of 'culture mentality' see, P. A. Sorokin, *Social and Cultural Dynamics*.

71 Quoted by I. S. Pool, in *Democracy in a World of Tensions*, p. 351. In the USSR and other Marxist-Leninist states, the Communist Party has indeed become the 'new class', more oppressive than the traditional capitalist class since it monopolises economic power as well as bureaucratic, political, military, police, secret service, intellectual, and other forms of power; see Milovan Djilas, *The New Class*. For want of the *sharī'a* type socialisation and restraints for elites and masses, the ruling elites of the developing countries have also become an oppressive new class, no different than the colonialists they replaced, and regardless of the type of their state. David Apter, in C. Geertz, pp. 94–104; L. H. Gann and P. Duignan, pp. 383–98; Guy Hunter, pp. 288f, *passim*; S. M. Lipset, in *Cleavages, Ideologies and Party Systems*, pp. 21–55; S. I. Keller, *Beyond the Ruling Elites* (New York: Random House, 1963), p. 274. Ibn Khaldun also pointed out the tendency of a new ruling elite to imitate its predecessors, *Muqaddimah*, 1:299f, 58.

72 P. M. Sweezy, in *Democracy in a World of Tensions*, pp. 404f, 409–12, and C. J. Ducasse's critique of Sweezy, *ibid.*, pp. 406–9.

73 *Ibid.*, p. 411.

74 Communism has been called 'dogmatic Marxism', and Westernism the 'non-dogmatic Marxism'. See S. M. Lipset, *Political Man* (New York: Anchor Books, Doubleday & Co., 1963), Introduction.

75 *Quran*, 2:178, 187, 229, 230; 4:13, 14; 9:98, 112; 11:112; 20:81; 55:8; 58:4; 65:1. The spirit of such voluntary and inner restraints invoked in the interest of justice is explicit in the warning given by the Prophet Muhammad when judging a case: 'It may be that some of you fail to prove his right

in the case. I am but a human being. If my judgement wrongly favours one undeserving, this shall only take him to hell.' Quoted in Said Ramadan, *What is an Islamic State?* (Geneva: Islamic Centre, AH 1381/AD 1961), pp. 3f.

76 For a summary of Western concepts of public interest, see W. A. R. Leys and C. M. Perry, *Philosophy and the Public Interest* (Chicago: Committee to Advance Original Work in Philosophy, 1959); G. Schubert, pp. 217–24; C. J. Friedrich (ed.), *Nomos V: The Public Interest* (New York: Amer. Soc. of Political and Legal Philosophy, 1962). Islamic philosophers of law and politics were the first to elaborate the concept of public interest in the context of humanism, universalism, and justice as understood in Islam. As a first approximation, they believed that public interest was served through conserving religion (Islam), life, reason, offspring, and wealth, the 'five universals' (*al-kulliyāt al-khamsd*) or basic aims of the sharī'a; M. H. Kerr, pp. 69, 85, 93. Cf. chapters 2 and 4, above.

77 G. A. Almond and G. B. Powell Jr., pp. 205–7.

78 G. A. Almond and J. S. Coleman (eds.), pp. 52–8, 558f; G. A. Almond and G. B. Powell Jr., pp. 128–64.

79 For example, the construction of monuments and militarism, plunging the nation in huge external debts and impoverishment, characterised Sukarno's regime in Indonesia and Nkrumah's in Ghana, particularly in the 1960s.

80 Cf. G. A. Almond and G. B. Powell Jr., pp. 86–8, for 'styles of interest articulation'.

81 M. M. Habibur Rahman K. Sherwani, *Life of Abu Bakr: The First Caliph of Islam*, trans. by S. M. Haq (Lahore: S. M. Ashraf, 1963), pp. 166, 50. Ibn Hisham, p. 687.

82 Nu'mani, 1:xvi.

83 *Ibid.*, 2:174, 225–30. This has since been imitated by many Muslim rulers. G. A. Almond and J. S. Coleman (eds.), p. 8, refers to Caliph Harun al-Rashid (d. AD 809). President Ben Bella, whose ideal was Caliph 'Umar, took special interest in 'driving his car at night through the city (Algiers) helping beggars, whom he placed in homes'. See 'Algerian Struggle', in *The Christian Science Monitor*, June 21, 1965, p. 2.

84 Nu'mani, 2:21–3, 33–41, 72–5, 149, 174, 212–14, 225–30, 242, 264. Ibn Khaldun, *Muqaddimah*, 2:268, 316f.

85 G. A. Almond and G. B. Powell Jr., pp. 199–201, and for other forms of 'capabilities of political systems', pp. 190–212.

86 Ibn Khaldun, *Muqaddimah*, 2:50, 53, 267ff, 403f; *et passim.*

87 *Ibid.*, 2:268.

88 Nu'mani, 2:47f, 56–59, also chapters 4, 9, 10, 12, 14 and 16; cf. Meier, *Leading Issues in Development Economics* (New York: Oxford Univ. Press, 1964), pp. 280–3, 489.

89 Nu'mani, 2:336–9.

90 M. Meyerson and E. C. Banfield (eds.), *Politics, Planning and the Public Interest* (Glencoe: Free Press, 1955), pp. 304–12. Banfield does not include competition and arbitration among 'political' decision-making activities.

91 C. E. Lindblom, chapters 4 and 5, especially pp. 330–5 for a summary of decision-making methods.

92 M. Meyerson and E. C. Banfield, pp. 307f.

93 For exhaustive discussion on 'bargaining', see C. E. Lindblom, especially chapters 4 and 5; R. A. Dahl and C. E. Lindblom, especially chapters 12, 13 and 17.

94 Nu'mani, 2:67.

95 *Jihād* and *ijtihād* are derived from *jahada*, to strive or struggle. Muslims must expend their human and material resources to strive in the 'path of God', that is, for social justice or common weal, *Quran* 49:15; 9:20; 61:11. The 'party of God' prefers this to unscrupulous loyalty and attachment to 'fathers, sons, brethren, spouses, nation, wealth, trade, dwellings', 9:23–4; 58:22. This altruistic struggle might lead to conflict situations, including (*qitāl*). Aggression is forbidden, 2:190–1. Permission is given to fight in self-defence, for idealistic reasons against oppressors, 2:190–3; 22:39; 42:39–43. War might be inevitable, 2:216, but resolution of conflicts through peaceful means is preferable, 8:38–40, 59–62. The methods and mechanisms of confrontation (*jihād*) can be many, such as pacification of potential enemies through use of economic resources, 9:60. From the environmentalist viewpoint, devastation, destruction of harvest, unnecessary cutting of trees, and slaughtering animals more than what is necessary for food, are forbidden in warfare, M. Hamidullah, *Muslim Conduct of State*, pp. 204–8, 312–16.

96 F. Rosenthal, in Ibn Khaldun, *Muqaddimah*, 1:lxxviii.

97 *Quran*, 5:2, 48; also 3:102–4, 109; 9:67, 71; 49:9–10. There should be co-operation among theists based on commonly shared values, 2:139; 3:63; 29:46.

98 Cf. M. Meyerson and E. C. Banfield, pp. 323f, 327f, according to whom the Islamic concept of public interest would be of the 'unitary' rather than 'individualistic' type, and the corresponding 'co-operative choice' type of decision-making process.

99 W. A. Baumol, *Economic Theory and Operations Analysis*, 2nd ed. (Englewood Cliffs: Prentice-Hall, Inc., 1965), pp. 375–80.

100 M. Hamidullah, *Muslim Conduct of State*, pp. 158f, *et passim*.

101 R. K. Linsley and J. B. Franzini, *Water-Resources Engineering*, McGraw-Hill Series in Sanitary Science and Water Resources Engineering (New York: McGraw-Hill, 1964).

102 *Ibid.*, 605–26. Cf. United Nations, ECAFE, *Manual of Standards and Criteria for Planning Water Resource Projects*, Water Res. Ser. No. 26 (New York, 1964); W. A. Hall and A. Dracup, *Water Resources Systems Engineering* (New York: McGraw-Hill, 1970).

103 United Nations, *Manual on Economic Development Projects* (New York, 1958); United Nations, ECAFE, *Programming Techniques for Economic Development*, Development Programming Techniques Ser. No. 1 (Bangkok, 1960); J. Tinbergen, *The Design of Development* (Baltimore: Johns Hopkins Press, 1958).

104 Cf. Todd, pp. 231f.

105 I. R. al-Faruqi, *Science and the Human Condition in India and Pakistan*, pp. 19–23.

106 This impression was confirmed in a personal interview by Dr Hubert R. Marshall, Professor of Political Science, Stanford University, an

expert in government and natural resources. Autumn 1970.

107 See, for example, S. M. Lipset, 'Some Social Requisites of Democracy: Economic Development and Political Legitimacy', *Amer. Pol. Sci. Rev.* LIII (March, 1959), pp. 69–105; G. A. Almond and J. S. Coleman (eds.), pp. 532–81.

108 A. J. Toynbee, *A Study of History*, 4:40ff; P. A. Sorokin, *Social and Cultural Dynamics*, 4:314f. In early 1971, it was estimated that out of India's 300 000 engineers, 60 000 were unemployed and 40 000 under-employed; despite reduced intakes in technical institutions, an additional 40 000 to 50 000 jobless were expected by 1974. Thus the socio-economic ills of India are not for want of technology and technicians. 'Election Issue in India', *The New York Times*, March 3, 1971.

109 Cf. chapter 3, n. 96. Western technical journals often exhort engineers to develop an integrated personality, and become managers in industry, public administrators and political leaders. See, for example, Sir Eric Ashby, 'Technological Humanism', *Jour. Institute of Metals*, vol. 85 (1957); B. Monck, 'The Eclipse of the Engineer in Management', *Engineering*, vol. 178 (1954), pp. 329–34; the Graham Clark Annual Lectures since 1955 published in the *Proc. Institution of Civil Engineers* (UK), for example, Sir Ewart Smith, 'Management and the Engineer', X (May), pp. 2–18. Some of the Politburo Members, USSR, were managers in industry and rose from the ranks of engineers. On medieval Islamic scientists who were also statesmen and philosophers, see, for example, S. H. Nasr, *Science and Civilisation in Islam*.

110 See, for example, E. St. Sure, *The TVA Ammonia Plant* (New York: Harcourt, Brace & Co., 1952); A. Maass, *The Kings River Project* (Indianapolis: Bobbs Merrill & Co., Inc., 1952); O. Stratton and P. Sirotkin, *The Echo Park Controversy* (University, Ala.: Univ. Alabama Press, 1959); C. Silverman, *The President's Economic Advisors* (University, Ala.: Univ. Alabama Press, 1959); K. Fox and I. Picken, *The Upstream-Downstream Controversy in the Arkansas-White-Red Basins Survey* (University, Ala.: Univ. Alabama Press, 1960); P. O. Foss, *The Grazing Fee Dilemma* (University, Ala.: Univ. Alabama Press, 1960); E. T. Carper, *The Defense Appropriations Rider* (Indianapolis: Bobbs Merrill & Co., Inc., 1960).

111 USA, Subcommittee on Evaluation Standards, Inter-Agency Committee on Water Resources, *Proposed Practices for Economic Analysis of River Basin Projects*, rev. (Washington D.C.: US Govt. Printing Office, 1958).

112 J. Hirshleifer, J. V. De Haven, and J. W. Milliman, *Water Supply: Economics, Technology, and Policy* (Chicago: Univ. Chicago Press, 1960), chapter 10, especially pp. 283f; R. R. Lee, especially pp. 295–320; R. K. Linsley and R. R. Lee, *The Proposed Ladera Dam* (Stanford: Project on Engineering Economic Planning, Stanford University).

113 Ibn Khaldun, *Muqaddimah*, 1:433 and n. 331a; E. I. J. Rosenthal, *Political Thought*, p. 243 and n. 57 above.

Chapter 6

1 Cf. P. A. Sorokin, *Social and Cultural Dynamics*, III, chapter viii.

2 *Ibid.*, IV, chapter xiii, for a discussion of 'free will theories' of economics as

a type of 'immanentist theories' *vis-à-vis* 'externalistic' and 'mixed theories'. Though Sorokin has misunderstood Ibn Khaldun's economic theory, it is in the mainstream of Islamic economic theory which is a 'free will theory' as proved by this chapter.

3 Cf. K. J. Arrow and T. Scitovsky (eds.), *Readings in Welfare Economics*, series published of Published Articles on Economics, vol. XII, Amer. Economic Association (Homewood: R. D. Irwin, Inc., 1969) pp. 26, 89 f, 390.

4 S. K. Nath, *A Reappraisal of Welfare Economics* (New York: A. M. Kelley, 1969), pp. i f, *et passim*; I. M. D. Little, *A Critique of Welfare Economics*, 2nd ed. (Oxford: Clarendon Press, 1958), chapter 5.

5 Western views of welfare economics are surveyed by E. J. Mishan, *Welfare Economics: Five Introductory Essays* (New York: Random House, 1964), and J. Baumol, *Welfare Economics and the Theory of the State*, 2nd ed. (Cambridge: Harvard Univ. Press, 1967). See also the works cited above in nn. 3, 4.

6 The works of Western scholars pertinent for this section are: R. A. Musgrave, *The Theory of Public Finance* (New York: McGraw-Hill Book Co., 1959), especially chapter 1; R. H. Haveman, *The Economics of the Public Sector* (New York: John Wiley & Sons, Inc., 1969); and R. N. McKean, *Public Spending* (New York: McGraw-Hill Book Co., 1968).
Works on Islamic economics pertinent for this section are: M. Umar Chapra, 'The Economic System of Islam: A Discussion of its Goals and Nature', *The Islamic Quart.*, XIV (AH 1389–90/AD 1970), pp. 3–18, 91–6, 143–56, 237–53; S. A. Ali, *Economic Foundations of Islam* (Bombay: Orient Longmans, 1964); M. Raihan Sharif, *Islamic Social Framework*, rev. ed. (Lahore: S. M. Ashraf, 1963); S. Qutb, *Social Justice in Islam*; A. A. Maudoodi, 'Economic and Political Teachings of the Quran', 1: 178–90; G. de Zayas, *The Law and Philosophy of Zakāt*, vol. I of *The Law of Zakāt*, 2 vols. (Damascus: Al-Jadidah Printing Press, 1960); Fazlur Rahman, 'Economic Principles of Islam', *Islamic Studies*, VIII, No. 1 (March, 1969), 1–8; Yahya b. Adam, Qudama b. Jafar, and Abu Yusuf, *Kitab al-Kharaj*, trans. A. Ben Shemesh (Leiden: E. J. Brill, 1958). Other useful works are: P. Aghnides, *Mohammedan Theories of Finance* (New York: Columbia University, 1916); S. A. Siddiqui, *Public Finance in Islam* (Lahore: S. M. Ashraf, 1962); *Some Economic Aspects of Islam*, compiled by the *Motamar al-Alam al-Islami* World Muslim Congress (Karachi: Umma Publ. House, 1964); Nasir A. Sheikh, *Some Aspects of the Constitution and the Economics of Islam* (Woking, England: Woking Muslim Mission and Literary Trust, 1961); Anwar I. Qureshi, *Islam and the Theory of Interest* (Lahore: S. M. Ashraf, 1961); Al-Ghazali, *The Mysteries of Almsgiving* (*Kitāb Asrār al-Zakāh*) in al-Ghazali's *Ihyā 'Ulūm al-Dīn*, trans. by N. A. Faris; *Ibn Taimiyya on Public and Private Law in Islam*, trans. by Omar A. Farrukh (Beirut: Khayats, 1966); Shaikh M. Ahmad, *Economics of Islam* (Lahore: S. M. Ashraf, 1964).

7 *Quran*, 20:6. *Qur'ān Mubin wa Faharis al-Quran* (*The Perspicuous Quran and Indexes of the Quran*), prepared by Mahmud Ramyar (Teheran: Amir Kabir, 1967), pp. 949 f, verses referred to under subject nos. 28 and 39. Hereafter referred to as *Qur'ān Mubin*. The editor of this work has provided 303 pages of 'word index' in Arabic giving reference to all verses of the Quran in which a particular word has been used, and 103 pages of a

similar 'subject index' in Arabic with Persian translation.

8 *Quran*, 16:78; 32:9; 55:3 f; 67:23; 90:8–10: 76:1–3; 90:4–10.
9 *Ibid.*, 16:80 f.
10 *Ibid.*, 4:32; 6:166; 16:71, 75, 76; 17:21.
11 *Ibid.*, 28:76–8.
12 *Ibid.*, 57:7.
13 *Ibid.*, 57:7.
14 *Ibid.*, 7:26, 27, 31, 35, 172; 17:70; 36:60.
15 *Ibid.*, 6:142–5; 16:10–16; 35:27 f; 39:21.
16 *Ibid.*, 30:22, 20; 35:27 f.
17 *Ibid.*, 43:22.
18 *Ibid.*, 2:213; 49:13; also see 4:1, 25; 7:189; 16:72; 35:28.
19 *Ibid.*, 2:29, 168; 7:10; 13:2–4; 14:32–5; 67:15.
20 *Ibid.*, 3:144; 14:34; 17:18–20; 57:25.
21 *Ibid.*, 17:70.
22 *Ibid.*, 80:1–10. For the exemplary behaviour of the Prophet Muhammad see, for example, S. Qutb, *Social Justice*, pp. 41, 49, 285 n. 44.
23 *Quran*, 2:247; 43:31.
24 *Ibid.*, 2:221–42; 4:15–35; 5:5; 24:2–10, 19, 23–6, 30–3; 33:3.
25 *Ibid.*, 107:1–7; chapter (Surah) 9, 'The Hyprocrites' (*passim*); 8:36.
26 *Ibid.*, 2:223; 17:23–6; 31:14 f; 33:6.
27 *Ibid.*, 2:177; 4:11–14, 177; 18:60–82. Cf. M. V. Merchant, *A Book of Quranic Laws* (Lahore: S. M. Ashraf, 1960), pp. 145–61. See also chapter I, n. 96.
28 *Quran*, 2:190. See also *Qur'ān Mubīn*, pp. 933–7 for Quranic references to which deeds constitute good conduct in civic life.
29 *Ibid.*, 2:190–3, 216 f, 251; 3:165–74; 4:74–6, 84, 88–91; 9:1–16, 20; 42:39–43; 49:9 f; 60:7–9; 61:11. See also chapter 5, n. 95.
30 *Ibid.*, 3:103; 5:3; 9:71 f, 105.
31 *Ibid.*, 17:16 f; 69:25–37; 89:17–20; 107:1–7.
32 *Ibid.*, 4:5–10, 74–6; 89:17–26.
33 A. L. Udovitch, *Partnership and Profit in Medieval Islam* (Princeton: Princeton Univ. Press, 1970). See also the works of S. A. Ali, S. Mahmud Ahmad, and *Some Economic Aspects of Islam* cited in n. 6 above.
34 Cf. Raihan Sharif, *Islamic Social Framework*, rev. ed. (Lahore: S. M. Ashraf, 1963), pp. 209–213.
35 *Quran*, 43:32. The founder of one of the five classical schools of Islamic jurisprudence, Ja far al-Sadiq (d. AH 148/AD 765) commented on this verse: 'God has established differences in their (men's) intentions (preferences), courage and endeavours, and all other conditions, and has made these the basis of flow of economic life, so that one may be dependent on the other for the satisfaction of his economic needs, to improve one's condition'. Another scholar, al-Qummi (d. AH 381/AD 991) commented: 'He (God) has maintained the same difference in men's qualities and capacities as in their looks. Inclinations and desires differ, so that one may seek help from others, because no one can be self-sufficient. . . . If each man were his own mason and tailor and barber and competent to satisfy all his needs, the world would not last a moment!' S. A. Ali, *Economic Foundations of Islam*, pp. 145 f; and see also n. below.
36 Muhammad ibn Zakariya al-Razi (d. AH 313/AD 925) wrote in his [*Al-Ṭibb al-Ruhānī*], *The Spiritual Physick of Rhazes*, trans. by A. J. Arbeny

(London: J. Murray, 1950), pp. 88–9: 'Each one of us eats, is clothed, has shelter, and is secure; yet the individual only prosecutes one of these businesses. If he is a husbandman, he cannot be a builder; if he is a builder, he cannot be a weaver; if he is a weaver, he cannot be a warrior.' On the division of labour, specialisation, and 'co-operation' and 'mutual assistance' he wrote:

> When many men agree to co-operate and help each other, they parcel out the various sorts of profitable endeavour among themselves; each labours upon a single business until he achieves its complete fulfilment, so that every man is simultaneously a servant and served, toiling for others and having others toiling for him. In this way all enjoy an agreeable life and all know the blessings of plenty; even though there is a wide difference between them and an extensive variety of rank and accomplishment; nevertheless there is not one who is not served and laboured for, or whose needs are not wholly sufficed.

Cf. the views of the eighteenth century English economist, Adam Smith, on gains in productivity due to division and specialisation of labour summarised by R. L. Heilbroner, *The Worldly Philosophers*, rev. ed. (New York: Simon and Schuster, 1961).

P. A. Kropotkin, *Mutual Aid: a Factor of Evolution* (London: W. Heinneman, 1902), refutes the Darwinist theories of competition, struggle for existence and survival of the fittest. This famous socialist argued in his classic that mutual aid is really the fundamental law of nature. He proved its existence among animals, 'savages', 'barbarians', and modern men. On mutual aid as the foundation of Islamic economics, see also S. Qutb, *Social Justice*, pp. 55–68, 171–5, 268 f, 272–5.

37 *Quran*, 92:8–10; 96:6 f, condemning claims to self-sufficiency.

38 Cf. P. A. Samuelson, *Economics*, 5th ed. (New York: McGraw-Hill, 1961), pp. 718–37.

39 See J. Tinbergen, *Shaping the World Economy* (New York: Twentieth Century Fund, 1962), on the actualities in the 1950s and unrealised potentialities of international economic co-operation on a regional and world-wide basis, including also the Afro-Asian Muslim countries.

40 *Quran*, 3:27; 4:89 f; 9:23 f; 11:42 f, 45 f; 31:14 f; 49:13; 58:22.

41 This insight found particular emphasis in the political and cultural sociology of Ibn Khaldun, *Muqaddimah*, and the leader of modern renaissance in the Indo-Pakistan subcontinent, Shah Wali Allah of Delhi (d. AH 1176/AD 1763), A. H. Siddiqi, 'Renaissance in Indo-Pakistan: *Shah Wali Allah Dihlavi*', in *History of Muslim Philosophy*, 2:1557–79.

42 *Quran*, 4:135; 5:8; 11:84–6; 16:90–2.

43 *Ibid.*, 49:9. See also chapter 5, nn. 95, 97.

44 *Ibid.*, 2:134, 286; 3:164 f; 6:70, 165; 16:96 f, 111 f; 17:15; 34:50; 35:18; 39:7, 17; 42:30; 45:15, 22. On 'reward of work or deeds', 'effort and work', 'compatible recompense for a wrong', 'reward of good work', and 'reward for bad deeds', see further references in *Qur'ān Mubīn*, pp. 928 f, subject nos. 13, 14, 22, and p. 991, subject nos. 8, 9.

45 *Quran*, 53:39; 4:32; also see 3:135, 194; 4:29, 100; 16:5–7, 14–18; 17:66; 34:18; 35:12; 39:39; 53:39–41; 79:34 f; 92:4 extolling earning through use of the numerous natural resources.

46 *Ibid.*, 2:198; 5:1 f, 94 f; 30:46; 62:10; 73:20.
47 *Ibid.*, 2:273; cf. 59:7. See also Khalid M. Khalid [*Min Hunā Nabdā'*] *From Here We Start*, trans. Ismail R. al-Faruqi (Washington D.C: Amer. Council of Learned Societies, 1953), pp. 37–40; S. A. Ali, *Economic Foundations of Islam*, pp. 76 f, 109, 131; Chapra, Islamic Quart., XIV (1970), pp. 6, 155.
48 *Quran*, 4:58, 105, 135, 138 f; 5:8, 40; 6:83, 153; 11:84–6; 16:90–2; 49:9 f; 57:25.
49 Some of these principles, for example those based on God's ownership of the universe and the economic trusteeship of man, were recognised as *sharī'a* maxims during and immediately after the time of the Prophet Muhammad, and incorporated in books on Islamic finance. See Yahya b. Adam, p. 123; Qudama b. Ja'far, pp. 83, 23; Abu Yusuf, (*passim*).
50 *Quran*, 4:29 f; 11:84 f; 17:34 f; 26:181–3; 55:7–9; 83:1–6.
51 *Ibid.*, 26:181–3; 83:1–6.
52 *Ibid.*, 2:168, 188, 282 f; 3:160; 4:10, 29–32; 12:52–7, 59; 20:81; 24:37.
53 *Ibid.*, 2:219; 5:90f, 5; 17:32; 23:2f, 19, 21, 23f, 30f, 33.
54 *Ibid.*, 2:280, 282 f; 5:1 f, 5; 4:19, 33; 16:91 f; 8:58, 72; 9:1, 7–15.
55 *Ibid.*, 4:2, 6, 10, 127; 6:153; 17:34; 26:183; 28:26–8.
56 Ibn Khaldun, *Muqaddimah*, especially 2:93–6, chapter 5 (*passim*); S. A. Ali, *Economic Foundations of Islam*; and the sources quoted in n. 49 above.
57 S. Mushtaq Hussain, 'Interest on Money and Islam: A Suggested Analysis', (Berkeley: Muslims Students Association, Univ. Calif. Berkeley, 1966), pp. 9–14.
58 *Quran*, 2:276–81.
59 *Ibid.*, 2:279.
60 S. F. Ulgener, 'Monetary Conditions of Economic Growth and the Islamic Concept of Interest', *Islamic Review*, (Feb. 1971), 11–14; Nasir A. Sheikh, 'Modern Authorities on Economics Vindicate Islam's Interestless (Usuryless) Economic System', *Islamic Review*, (July 1967), 11–13. There is a growing body of literature discussing profit and loss sharing 'partnership' (*sharikah*) enterprises. See references cited in n. 6 above, and also articles published in Islamic periodicals like the *Islamic Review*, *Islamic Studies* and *Voice of Islam*.

A few efforts were started in the 1960s to implement the principles of Islamic economics on investment and loan banks. R. K. Reddy, 'The Egyptian Municiple Savings Bank Project', pp. 2–5; the Kuwaiti Financing Project (*Bayt al-Tamweel al-Kuwaiti*), P.O. Box 2857, Kuwait; the *Tur Bayt al-Mal*, Fatah Darwaza, Hyderabad, India. Such efforts have grown in recent years, the largest Islamic credit bank now is the Islamic Development Bank, Jeddah, Saudi Arabia.
61 *Quran*, 17:26 f, Also Qur'ān Mubīn, p. 938 subject no. 5, on 'extravagance' (*israf*).
62 *Quran*, 9:34 f; 47:36–8; 53:32–41; 70:15–18. Also *Qur'ān Mubīn*, p. 938, subject no. 9, 'niggardliness' *bukhul*.
63 *Quran*, 2:168; 4:32; 15:88; 20:131.
64 *Ibid.*, 11:87.
65 Yahya b. Adam, p. 123 and Traditions nos. 315, 318–22; Abu Yusuf, p. 126.

66 *Quran*, 8:1. Also *The Holy Quran*, n. 979, and *The Message of the Quran*, trans. M. Asad, n. 1 of chapter 8 for the meanings of *anfal*.

67 *Quran*, 59:6 f. Also *The Holy Quran*, n. 2477.

68 'The capital a person earns and acquires if resulting from a craft, is the value realised from his labour. This is the meaning of 'acquired (capital)'... If the profit results from something other than a craft, the value of the resulting profit and acquired (capital) must (also) include the value of labour by which it was attained. Without labour, it would not have been acquired... It has thus become clear that gains and profits, in their entirety or for the most part, are value realised from human labour.'

Ibn Khaldun, *Muqadimmah*, 2:313–14. Cf. Karl Marx's concept of capital as the value of unpaid labour.

69 *Quran*, 16:17.

70 M. Asad, *The Message of the Quran*, 9:58 n. 81; de Zayas, 1:3 f, 279–83; Aghnides, pp. 203 f, 439 n. 3.

71 For example, Al-Ghazali, *The Mysteries of Almsgiving* [*Kitāb Asrār al-Zakāh*]; cf. P. Aghnides, pp. 204, 429.

72 *Quran*, 6:164; 17:15; 35:18; 39:7; 53:38.

73 Yahya b. Adam, p. 123, and Traditions (*Sunnah*) nos. 303, 304, 349.

74 *Quran*, 2:279; also 2:272; 4:77; 8:60.

75 *Ibid.*, 6:38; also 41:10; 55:10–13; 2:21 f; 17:37, 70.

76 *Ibid.*, 9:103.

77 *Ibid.*, 70:24 f; also 51:19.

78 *Ibid.*, 59:7.

79 *Ibid.*, 2:233.

80 *Ibid.*, 2:286; also 4:28; 40:31.

81 *Ibid.*, 64:16; 59:9.

82 *Ibid.*

83 *Ibid.*, 2:219.

84 *Ibid.*, 3:39.

85 *Ibid.*, 28:77; also 24:33.

86 *Ibid.*, 2:190–3, 216 f, 249, 251; 3:165–74; 4:74–6, 84; 8:39; 9:15 f, 19 f, 24, 29, 44 f, 81, 88, 111 f, 123; 22:39 f; 42:39–43; 49:9 f, 15; 60:79; 61:11.

87 *Ibid.*, 2:215, 219, 261–81; 3:13–16, 22, 91, 133, 179; 4:36–9; 8:2–4, 36, 60; 9:20, 34 f, 44 f, 75–89, 97–112; 10:57 f; 11:27, 31, 87; 13:22–4; 14:31; 16:71, 75; 23:55 f, 60 f; 28:76–8; 42:38; 47:36–8; 49:15; 51:19; 57:7, 10 f, 18, 23 f; 58:12 f; 59:7; 61:10–12; 63:9–10; 64:15–18; 70:24 f; 89:17–26; 90:5–7, 11–16; 92:5–18; 102:1–8; 107:1–7.

88 *Ibid.*, 9:79.

89 *Ibid.*, 2:268, 272; 3:179; 7:31; 9:34; 25:67; 47:36–8; 57:11, 18, 23 f; 64:15–18; 70:18, 21; 90:5–7, 11–16; etc.

90 For traditional discussion of the eight classes of beneficiaries given in *Quran*, 9:60, see de Zayas, 1:288–309, and the works of S. A. Siddiqi, P. Aghnides, and others given in n. 6 above.

91 *Quran*, 9:60.

92 *Ibid.*, 2:273.

93 *Ibid.*, 51:19; also 70:24 f.

94 *Ibid.*, 57:18; also 57:11; 64:17.

95 *Ibid.*, 8:61; also 8:60–2, 38–40; 2:192 f; 47:4.
96 *Ibid.*, 2:264; 4:38.
97 *Ibid.*, 9:99.
98 *Ibid.*, 2:262–4.
99 *Ibid.*, 2:268, 272; 3:179; 23:55 f; 47:36–8; 57:23 f; 64:16; 70:21.
100 *Ibid.*, 90:5–11.
101 *Ibid.*, 24:55 f.
102 *Ibid.*, 2:266.
103 *Ibid.*, 61:10; cf. 92:5–11.
104 *Ibid.*, 2:195.
105 Islamic philosophers and economists have believed that economic inequality and oppression, and the neglect by government of economic growth, cause the fall of states and civilisations. See, for example, Abu Yusuf (d. AH 182/AD 798), pp. 35–9. See also n. 41 above.
106 *Quran*, 4:32.
107 *Ibid.*, 57:7, 10; 24:33.
108 *Ibid.*, 9:99.
109 *Ibid.*, 9:103 f.
110 *Ibid.*, 63:9 f.
111 *Ibid.*, 14:31.
112 *Ibid.*, 2:207.
113 *Ibid.*, 9:111.
114 *Ibid.*, 8:41.
115 A. A. Maudoodi, *A History of Muslim Philosophy*, I, 185 f.
116 See the works of Abu Yusuf, Qudama b. Ja'far, Yahya b. Adam, and the secondary source works of de Zayas, P. Aghnides, and others cited in n. 6 above.
117 *Quran*, 2:134, 141.
118 For example, de Zayas, I, p. xxvi.
119 *Ibid.*, I, 3–6, 281 ff.
120 Abu Yusuf, pp. 90 f, 103 f, 146; Yahya b. Adam, p. 123, *et passim*; Qudama b. Ja'far, p. 83, *et passim*.
121 E. D. Fagan, 'Theories of Progressive Taxation', in *Readings in the Economics of Taxation*, pp. 19–53.
122 Cf. Musgrave, especially chapter 1; Haveman; McKean; and U.S., Congress, *The Analysis and Evaluation of Public Expenditures: The PPB System* (1969), 3 vols., especially vol. 1.
123 See the works of Raihan Sharif, Anwar Quraishi, S. Mahmud Ahmad, and S. A. Siddiqi cited in n. 6 above.
124 For example, US, Proposed *Practices for Economic Analysis of River Basin Projects*, rev. ed. (Washington D.C.: US Govt. Printing Press, 1958).
125 Cf. A. M. Henderson, 'The Pricing of Public Utility Undertakings', in *Readings in Welfare Economics*, pp. 541–60.
126 Shigeto Tsuru (ed.), *Proceedings of International Symposium on Environmental Disruption* (Tokyo: Asahi Evening News, March 1970), especially the papers by E. Dahmen, 'Environmental Control and Economic Systems', pp. 149–59; V. S. Semonov, 'Man in Socialist City Environment and Problems of Scientific City Planning', pp. 160–70; M. I. Goldman, 'Environmental Disruption in the Soviet Union', pp. 171–89; R. W. Judy, 'Economic Incentives and Environmental Control', pp. 190–202 and A.

Breton, 'Preface to Institutional Welfare Economics', pp. 101–13.

127 *Quran*, 41:10.

Chapter 7

1 At the request of the author this chapter was reviewed in 1971 by Dr. Lewis W. Spitz, Professor of Renaissance and Reformation History, Stanford University. One of his works is *The Renaissance and Reformation Movements* (Chicago: Rand McNally & Co., 1971). The comments offered by Professor Spitz on the section, '"Islamicisation" of the West', are are incorporated in nn. 25, 26, 45, 48, 50 and 57.

2 R. L. Beals and H. Hoijer, *An Introduction to Anthropology*, 3rd ed. (New York: Macmillan Co., 1966).

3 I. R. al-Faruqi, *Christian Ethics*, pp. 22–32.

4 P. A. Sorokin, *Social and Cultural Dynamics*, 4:45 ff. For definition of sociological terminology employed in this chapter, see *ibid.*, especially 4:45–95. The terms social, cultural, and socio-cultural have been used interchangeably. An excellent summary of Sorokin's main ideas is given by C. C. Zimmerman, *Sorokin, The World's Greatest Sociologist* (Saskatoon: Univ. Saskatchewan, 1968).

5 D. Bidney, s.v. 'Cultural Relativism', *International Encyclopaedia of Social Sciences*, III (New York: Macmillan Co., 1968), p. 543; R. Redfield, 'A Critique of Cultural Relativism', in *Readings in Sociology*, p. 34.

6 T. Parsons, *The Social System* (New York: The Free Press, 1968), pp. 58–67.

7 G. A. Almond and J. S. Colman (eds.), pp. 21–5; cf. pp. 532 f.

8 As quoted in *A History of Muslim Philosophy*, 1:7. There is an occasional awareness of the inadmissibility of such Western Views. See M. G. S. Hodgson, 'Modernity and the Islamic Heritage', in *Islamic Studies*, I (June 1962), 88–129.

9 For examples of condemnation of amoral familialism and *'aṣabiyya*, and exhortations on justice in favour of friend or foe, see *Quran* 4:135, 138–9; 5:8; 9:23–4; 16:90–1; 29:8; 31:14–16; 49:9–10. Abu Jahl, an uncle of the Prophet Muhammad who was killed while leading the enemies of Islam, prayed in the Battle of Badr (ATH 2/AD 624) in which sons and fathers and relatives were pitched against each other: 'O God, destroy this morning him [Muhammad] that more than any of us hath cut the ties of kinship and wrought that which is not approved.' Ibn Hisham, p. 301; this earliest biography is full of such instances of the clash of values. See also Nu'mani, especially pp. 8–10, 21–3, 26–41, 72 f, 196–220, 237–43; Habibur Rahman Sherwani, *Life of Abu Bakr*, especially pp. 87, 99–118, 124, 130, 160, 162.

10 Mehdi, *Ibn Khaldun's Philosophy*, pp. 193–204, 257 f; Rabī', pp. 48–55, *et passim*, Ibn Khaldun, *Muqaddimah*, especially I, chapter 2, and II, chapter 4 (*passim*).

11 P. A. Sorokin, *Social and Cultural Dynamics*, 4 vols; Ibn Khaldun, *Muqaddimah*, 3 vols. The philosophies of history of Sorokin, Ibn Khaldun, and others have been compared by A. J. Toynbee. 'Sorokin's Philosophy of History', in *Pitirim A. Sorokin in Review*, pp. 67–94.

12 See chapter 3, nn. 51, 52.

13 For a sample of early and medieval Islamic views of the Fourth Rightly Guided Caliph Ali, al-Kindi, al-Ghazali, and Ibn Rushd, see Farukh, pp. 8, 52, 104; Arberry, *Revelation and Reason in Islam* (London: George Allen & Unwin Ltd, 1957), pp. 34 f. for modern Muslim views see, for example, K. A. Hakim, *Islamic Ideology*, pp. 293–7; S. H. Nasr, *Science and Civilisation in Islam*, pp. 25, 30 ff; S. H. Nasr, *Islamic Studies*, pp. 18 f; K. A. Faruki, *Ijma' and the Gate of Ijtihād*, pp. 11 f; W. A. Eddy, 'King Ibn Sa'ūd', pp. 257–63.

14 P. K. Hitti, pp. 100 f.

15 *Ibid.*, p. 117.

16 Nu'mani, 2:46 f, 50, 55–9, 211 f.

17 S. Sulaiman Nadvi, pp. 85–91; S. M. Iqbal, pp. 128 f; S. H. Nasr, *Science and Civilisation in Islam*, pp. 126 f, 297, 205 f; M. M. Sharif (ed.) *A History of Muslim Philosophy*, 2 vols.

18 G. Sarton, *Introduction to History of Science*, 1:700, 710, 681; P. K. Hitti, *History of The Arabs*, pp. 576 f; S. H. Nasr, *Science and Civilisation in Islam*, pp. 204, 212, 214; Briffault, *Making of Humanity* (London: George Allen & Unwin Ltd, 1919), p. 201; K. S. Shah, 'Medicine', in *History of Muslim Philosophy*, 2:1332–48.

19 G. Sarton, *Introduction to History of Science*, 1:681 f, 479 f, 372, 301–7.

20 *Ibid.*, 2:424 f, 1:634, 621; P. K. Hitti, p. 575; S. H. Nasr, *Science and Civilisation in Islam*, 109 f, 111 f.

21 Ibn Khaldun, *Muqaddimah*, 3:151 f.

22 *Ibid.*, 3:150, *'sharī'a'* substituted for 'religious law' in the translation.

23 *Quran*, 18:110.

24 F. B. Artz, *The Mind of the Middle Ages, AD 200–1500*, 2nd ed. (New York: A. A. Knopf, 1954), pp. 164 f.

25 *The Protestant Ethic and the Spirit of Capitalism*, Author's Introduction, pp. 13–31. Professor Spitz asks basically the same questions as Weber. 'Why did modern science and technology develop as a socially significant force in the West rather than in other cultures? Why in Christian countries rather than, say, Moslem? And why did it follow so closely upon the heels of the Reformation?' L. W. Spitz, pp. 580 f.

The best historical refutation to date of the theses of Weber and Professor Spitz is G. Sarton, *An Introduction to History of Science*, 3 vols. in 5.This dissertation indirectly refutes these theses by pointing out the Quranic naturalism, Islamic epistemology and Islamic jurisprudence, and in this short section of this chapter. For a more detailed refutation, see Tasneem Fatima, 'A Refutation of Max Weber's Historical Claims on the Uniqueness of Intellectual, Scientific, and Philosophical Development in the West', (USA, 1971).

26 P. A. Sorokin, *Social and Cultural Dynamics*, 2, chapter 3, especially 150 ff, 152n. 16, 500n. 29; 4, chapters 6, 7, especially pp. 312n. 24, 362n. 14. Professor Spitz comments: 'Sorokin, a sociologist, is not really an accepted authority for the relation of science and religion in the medieval period. Much to be preferred are the *historians* of science such as Pierre Duhem, *Le Système du Monde: Histoire de doctrines Cosmologiques de Platon à Copernic*, 10 vols. (Paris: A. Herman, 1954–59); Edward Rosen and Thomas S. Khun. Duhem argues that the Franciscan nominalists made their great

breakthrough in the impetus theory, for example, by rejecting the Aristotelian theory which had been transmitted to the West by Arabic thinkers.

One must define 'modern science'; and the year 1640 is a convenient one for the starting point of modern science which became a major cultural force in the seventeenth century. See H. Butterfield, *The Origins of Modern Science, 1300–1800*, rev. ed. (New York: Collier Books, 1962).

> Strangely enough the Renaissance period is considered a low point in science due to the emphasis on art and letters. There is an elaborate literature on the question of Renaissance, Reformation, and Science which you do not take into account in the notes. See the attached bibliography [n. 57 below]. What the medieval scholastics absorbed from Islamic scholars was Aristotelian philosophy, superior to the Neoplatonism of the earlier Middle Ages. The Renaissance, by bringing purer Greek texts of Aristotle from the East, improved on that inheritance so that Aristotle enjoyed great prestige in the 16th and part of the 17th century.

We think Sorokin is relevant because his judgements are based on statistical analysis of historical data presented, for example, in the entire *Encyclopaedia Britannica*, and G. Sarton, *An Introduction to History of Science*, 3 vols. in 5. That these source works are biased against Islamic culture in relation to Western culture is a factor that must be taken into account in interpreting Sorokin's analysis. For example, great Muslims are not even mentioned in the *Encyclopaedia Britannica* while plenty of space is devoted to mediocre Europeans, and obscure Englishmen. For a critique of the shortcomings and inadequacies of procedures and techniques in quantitative sociological studies, particularly those of Sorokin, see A. J. Toynbee, 'Sorokin's Philosophy of History', pp. 67–94; M. W. Riley and M. E. Moore, 'Sorokin's Use of Sociological Measurement', pp. 206–14, and Sorokin, 'Reply to My Critics: Problems of Sociological Measurement', pp. 440–49 in *Pitirim A. Sorokin in Review*. The Franciscans were among the most adept imitators of Islamic science and philosophy. The impetus theory has its antecedents in Muslim anti-Aristotelians,, S. H. Nasr, *Science and Civilisation in Islam*, pp. 126 ff, 138, 314 f.

However, the origins of 'modern science' must be traced not in startling new discoveries of science but in the discovery and practise over a long period of time of the 'scientific method' in medieval Islamic culture. Medieval Islamic scientists and philosophers were neither Neoplatonists, Aristotelians, nor even anti-Aristotelians *per se*. They were a class by themselves, that of Islamic scientists and philosophers. They were devout Muslims thoroughly educated in Islamic jurisprudence and Quran interpretation, comprising the *shar'iyya* sciences which dominated medieval Muslim education and pervaded individual daily life and the socio-cultural system. Their points of contact and conflict with classical Greek thought and the Near Eastern religions and ideologies must be studied as incidental to the birth and growth of medieval Islamic or *shar'iyya* science, philosophy, and the whole socio-cultural system. See also n. 17 above.

27 P. A. Sorokin, *Social and Cultural Dynamics*, I, especially 97–9.

28 *Ibid.*, 2:98.

29 *Ibid.*, 2:95–7, 500.

30 G. Sarton, *An Introduction to History of Science*, 1:626, 694, 701.

31 E. Gilson, *History of Christian Philosophy in the Middle Ages* (New York: Random House, 1955), especially pp. 181–224, 235–46; also 277–94, 387–401, 521–27; *History of Muslim Philosophy* 2 vols., especially 2: 1349–81; G. Sarton, *An Introduction to History of Science* (3 vols. in 5), under specific scholars and philosophies such as Ibn Rushd. 2 : 355–361; St Thomas Aquinas, 2 : 914–921; Albert the Great, 2 : 934–44, and Averroism, *passim*; Farrukh, *The Arab Genius* pp. 81–110.

32 P. A. Sorokin, *Social and Cultural Dynamics*, 2 : 99, 97 ff.

33 R. Hammond, *The Philosophy of al-Farabi and its Influence on Medieval Thought* (New York: Hobson Press, 1947); cf. I. Madkour, 'Al-Farabi', in *History of Muslim Philosophy*, 1 : 450–68, 2 : 1370–2, *et passim*; E. Gilson, pp. 184–7; E. A. Myers, *Arabic Thought and the Western World in the Golden Age of Islam*, pp. 16–43.

34 G. Sarton, *Introduction to History of Science*, 2 : 914 f.

35 *Ibid.*, 2 : 1–2, 98–9, 109, 321; *et passim*; G. Sarton, in *Homenaje á Millas-Vallicrosa*. pp. 317–8. These broad generalisations refer particularly to science, and the prime of its influence not the complete end. For example, two more Latin editions of Ibn Sina's *Canon* were published in AD 1659 in Paris and Padua as textbooks for medical students (*ibid.*, p. 318); Peter the Cruel built the castle, Alcazar of Seville, in Moorish style over a century after the moors were driven out of Seville, G. Sarton, *An Introduction to History of Science*, 3 : 1021; the agricultural and industrial techniques, and administrative methods of Muslims continued to be used in Spain long after the Christian reconquest, Imamuddin, *Some Aspects*, pp. 71, 196, 199, *et passim*; the pilot who navigated the ship of Vasco da Gama was a Muslim, J. Vernet, 'Arab Astronomers', *Islamic Review* (Feb. 1951), pp. 17–19; *ad infinitum*.

36 See R. W. Southern, *Western Views of Islam*, for a brief and excellent review of these contacts, conflicts, and strategies.

37 R. W. Southern, *The Making of the Middle Ages* (New Haven: Yale Univ. Press, 1959), p. 40, also pp. 36–41, 65–8; R. W. Southern, *Western Views of Islam* pp. 14 ff. For a detailed account of these Western views and attitudes from medieval to recent times, see N. A. Daniel, *Islam and the West: The Making of an Image* (Edinburgh: Edinburgh Univ. Press, 1960), and N. A. Daniel, *Islam, Europe and Empire* (Edinburgh: Edinburgh Univ. Press, 1967).

38 M. Nakosteen, *History of Islamic*, especially pp. 179–200.

39 E. Gilson, p. 293.

40 Henry O. Taylor, *The Medieval Mind*, 2 vols. (Cambridge: Harvard Univ. Press, 1949), 2 : 514–38.

41 G. Sarton, *An Introduction to History of Science*, 2 : 952–67; Briffault, pp. 200 f.

42 R. W. Southern, *Western Views of Islam*, pp. 52–64.

43 S. H. Iqbal, p. 129. cf. R. W. Southern, *Western Views*, pp. 56–7; Lynn Thorndike, *A History of Magic and Experimental Science*, 2 vols. (New York: Macmillan Co., 1923), 1 : 646.

44 Briffault, pp. 206, 212–14, Cf. G. Sarton, *Introduction to History of Science*, 2 : 575–9, *et passim*; P. K. Hitti, *History of the Arabs*; pp. 609–12; M. Nakosteen, *History of Islamic Origins*, pp. 7–9, 184–6.

45 Briffault, p.214. The cultural level of Western Christendom in the mid-AH

seventh/AD thirteenth century can be gauged by the fact that, among the denunciations hurled at Frederic II, 'it was alleged with horror that he indulged in a daily bath – even on Sundays!' *Ibid.*, p. 213.

Professor Spitz adds: 'However, the opposition and hositility between Frederic II and the popes had much more a political than an ideological base. Rome was distressed by the encirclement by the Hohenstaufens with a political base in the North and to the south. See G. Barraclough, *The Origins of Modern Germany* (Oxford: B. Blackwell, 1946).

46 R. W. Southern, *Western Views*, pp. 62–6.

47 *Ibid.*, pp. 77–83; G. Sarton, *Introduction to History of Science* 3 : 1346–50. My limited knowledge of Wycliffe shows that he did not explicitly call for imitation of Islam and Muslims though they were the living model of what Christendom desired to be and to have most. The basic strategy of Catholic and Protestant reformers and counter reformers was to identify all disvalues with a false image of Islam and Muslims, accuse each other of being 'Mahomets' (Muslims) according to this simulated model, while both groups Islamicised themselves all the while!

48 *Ibid.*, p. 97. Professor Spitz points out: 'Strangely enough you overlook one of the strongest advocates of an intellectual rapprochement between Christianity and Islam, namely Raymond Lull. The Lullian tradition remained alive to the end of the 16th century. See W. J. Bouwsma, *Concordia Mundi: The Career and Thought of Guillaume Postel, 1510–1518* (Cambridge: Harvard Univ. Press, 1957).

It is untrue to call Lull (d. AH 716/AD 1316) an advocate of an 'intellectual rapprochement.' He was the advocate of a moral crusade against Islam which later led to the founding of the Christian missionary movement. Despite his study of Arabic, and writings on Sufi theology and philosophy, 'he essentially preserved his enmity against Islam.' Sharif (ed.) *A History of Muslim Philosophy*, 1351. cf. Daniel, *Islam and the West, passim.*

49 R. W. Southern, *Western Views*, pp. 104–7; P. A. Sorokin, *Social and Cultural Dynamics*, 2499.

50 Ziya Gokalp, *Turkish Nationalism and Western Civilisation: Selected Essays of Ziya Gokalp*; trans. by N. Berkes (New York: Columbia Univ. Press, 1959) pp. 222 f; cf. Hakim, *Islamic Ideology*, p. 285.

Professor Spitz suggests a book relating the contacts of Western reformers like Philipp Melanchthon with the Muslim East: Ernst Benz, *Wittenberg und Byzang: zur Begegnung und Auseinandersetzung der Reformation und der Östlich-orthodoxen Kirche* (Marburglh: Elwert: Gräfe und unzer, 1949).

51 R. W. Southern, *Western Views*, p. 107. These 'typical products' comprised the entire technological or material culture, that is the 'non-ideological' part of the whole socio-cultural system or civilisation. The agricultural and water resources engineering and technology were of Muslim development. S. M. Imamuddin, *Some Aspects of the Socio-Economic and Cultural History of Muslim Spain, 711–1492 AD* (Leiden: E. J. Brill, 1965), and 'Al-Filahah (Farming) in Muslim Spain,' pp. 51–89. The European markets carried among fabrics 'Persian taffetas, damasks from Damascus, baudekin from Baghdad, muslin from Mosul, gauzes from Gaza, grenadines from Grenada.' 'The women of Europe learnt to wear an Arab

kamis (chemise) and *jubba* (jupe, jupon),' and 'developed a waist and rustled silken trains.' They too put up their hair elegantly, wearing 'embroidered and jewelled Persian tiaras of *cendal* (Ar. *candal*).' Briffault, pp. 205, 209. The Islamicisation of intellectual culture in Spain as early as the mid-second/ninth century was described by Alvaro, a contemporary Cordovian bishop:

> The Christians love to read the poems and romances of the Arabs; they study the Arab theologians and philosophers ... Alas! all talented young Christians read and study with enthusiasm the Arab books; they gather immense libraries at great expense; they despise the Christian literature as unworthy of attention. They have forgotten their language. For every one who can write a letter in Latin to a friend, there are a thousand who can express themselves in Arabic with elegance, and write better poems in this language than the Arabs themselves.
> R. W. Southern, *Western Views*, p. 21.

52 Martin Luther, 'On War Against the Turk, 1529', in T. G. Tappert (ed.), *Selected Writings of Martin Luther: 1529–1546*, 4 vols. (Philadelphia: Fortress Press, 1967), 4:28.
53 R. W. Southern, *Western Views*, p. 106.
54 *Quran*, 13:11; also 8:53.
55 Western man's self-misrepresentation leads him on to transvaluation and disvalues. Those who act on these beliefs become colonialists, racists, Nazis, Fascits, and so on; and those Westerners who do not act thus pour the vials of wrath on those who do, their alter ego! T. R. al-Faruqi, *Canadian Jour. Theology*, VII, No. 2 (1961), 99–107.
56 See chapter 3, n. 79. and chapter 5, n. 20.
57 Along with the sources cited in nn. 26, 45, 48 and 50, Professor Spitz suggests the following references: Ferdnand Brunner, *Platonisme et Aristotélisme*; *La Critique d'Ibn Cabirol par Saint Thomas d'Aquin* (Louvain: Publications Universitaires de Louvain, 1965). Charles S. Singleton (ed.), *Art, Science, and History in the Renaissance*, (Baltimore: Johns Hopkins Press, 1967), Part 2: Science; B. A. Gerrish, 'The Reformation and the Rise of Modern Science', in J. C. Brauer (ed.), *The Impact of the Church upon Its Culture* (Chicago: Univ. Chicago Press, 1968) Robert Schowoebel, *Renaissance Men and Ideas* (New York: St Martin's Press, 1970); John Dillenberger, *Protestant Thought and Natural Science* (Garden City, New York: Doubleday, 1960); L. W. Spitz, pp. 580–92.
58 A critique and discussion of properties of socio-cultural dynamics, referring also to the well-known views of G. Tarde, A. J. Toynbee and others, are given by Sorokin, *Social and Cultural Dynamics*, 2, 5–7, 12, 13. cf. chapter 3, nn. 70, 71.
59 P. A. Sorokin, *Social and Cultural Dynamics*, 4:45.
60 *Ibid.*, 4:82 f.
61 *Ibid.*, 4:73.
62 *Ibid.*, 4:602–605, also 73 f, 619.
63 *Ibid.*, 4:74–76.
64 *Ibid.*, 4:76f.
65 *Ibid.*, 4:605–18, 78–82.

66 Cf. P. A. Sorokin, *Social and Cultural Dynamics*, chapter 4, especially pp. 163 f. A classical statement of ideological determinism of socio-cultural rejuvenation and growth is Weber, *The Protestant Ethic and the Spirit of Capitalism*, trans. by T. Parsons (New York: Scribner's Sons, 1952).

67 A. M. Kamali, pp. 59–81.

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