Traditional Greco-Arabic and Modern Western Medicine: Conflict or Symbiosis*

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(1920-1998)

The system of medicine which is today known as the Greco-Arab has had a varied history, especially in view of the several complex, ethnic factors that go to confer complexity upon it. Ibn Sina defines medicine as "the knowledge of the states of the human body in health and decline in health: its purpose is to preserve health, and endeavour to restore it whenever lost[1]." It had its origin in Egypt and Mesopotamia, but it was in Greece that it underwent a proper systematization and one can visualize it like a river that, reaching the delta, gathers the debris of minor civilizations and the tributaries of the major ones. As the world-vision or the *weltanschauung* of the different cultures expanded in keeping with the evolution of mankind, so did what we know as the Greco-Arab system; and in the hands of the Arabs or people that were Arab by culture[2], if not by race or even by religion[3], it reached its very zenith. Historians of the West are, perhaps correct in designating it as Arabic medicine; but the Muslim historians and practitioners of medicine, out 'of humility and out of adherence to the truer historical perspective call it *Tibb al-Yunani* (the Greek system of medicine)[4].

As I have had the occasion to point out just now, the Greek system of medicine did not originate as such in Greece. No culture and, therefore, no such system can take nourishment in a closed and insulated atmosphere. History has amply shown that nations, while developing their own characteristic ethos, are composts of many a factor: Greece was no exception to it. The system that crystallized during the Golden Age of Greece comprised several factors: the Assyrian, Babylonian, Mesopotamian, Egyptian, Iranian and Indian, to cite only a few more prominent instances. By the time of Galen and Dioscorides, so much more knowledge had supervened that it was, properly speaking,

*Discussion/presentation at the University of Berne, Berne, Switzerland in February 1975 under the series "Islam and the Occident".

Greco-Roman. In fact, although the vast majority of us is prone to treating the Romans as an offspring of the Greeks, Marcus Porcius Cato or Cato the Censor, in his *Praecepta ad filium* shows himself to be a violent opponent of Greek medicine and philosophy. His *De Agri Cultura* is the first book in Latin on medicinal simples, agriculture, and horticulture.

The Romans, if anything, were a more practical people. No more cogent examples of this can be furnished than those of Aurelius Cornelius Celsus (flourished first century A.D.), who is regarded as the writer of the greatest medical work of antiquity after the works of Galen and Hippocrates. Books VII-VIII of *de Medicina Libri* give, for example, the first complete account of the skeleton, and many of his surgical and medical descriptions "have become classical: lateral lithotomy, operation of the cataract, plastic operations, removal of the tonsils, area celsi (a skin disease), dental practice," and so on. Similarly the *Naturalis Historia* of Pliny the Elder or Gaius Plinius Secundus (23-79 A.D.), another full-blooded Roman, is indispensable to the history of *materia medica.*

The Egyptian System of Medicine

Of the civilizations, which influenced the Greeks most, was undoubtedly the Egyptian. In fact, this influence persisted till the decline of the Roman Empire. The Egyptian influence was transmitted to Greece through the Minoan culture of Crete; and the invading Dorians and Ionians from northern Europe imbibed the Egyptian culture – and, therefore, the medicine as well, indirectly from that source. In fact, it might be safely said that just as the basis of *Tibb* is Greek, the foundation of the Greek system is the Egyptian. This point has been discussed in considerable detail by H. Grapow, H. von Deines, and W. Westendorf in *Grundriss du Medizin der Alten Agypter* (6 vols., Berlin, 1954-1962). *'Asal* or honey, so basic to *Tibb,* is the *hprnly.t* of the ancient Egyptians (Grapow, 43). Examples like these could be multiplied. The Egyptian era spans five to six millennia, and the recorded history: of Egyptian medicine has come down to us from the papyri, which themselves were taken by the Greeks. Possibly the notion of recording itself was transmitted to the Greeks by the Egyptians. These papyri were written about 1500 B.C., and the experience enshrined in these papyri goes back to the dawn of history; for medicine and human consciousness are coeval. Medicinal recipes mentioned in these papyri were in practice by 2000 B.C.

The medical literature that we see reflected in the papyri relates to the functions of the bodily organs and the manifestations of ailments. It is believed that these prescriptions were written by Imhotep, the founder of the Egyptian medical system.

The Egyptian *weltanschauung,* as should be expected, is partly empirical, partly shamanian, partly superstitious, and very largely, as behoves a dynamic civilization, rational. The last reflects the experimental and inductive tendency.

The Egyptians regarded the brain as the seat of the mental and behavioural acts and the heart as the centre of the manifestations of life. During the Neolithic Age it was common to bore a hole in the skeleton and the medical practitioners of North Africa and Western Europe knew about the membranes and the cavities in the brain. These records are, therefore, important from the viewpoint of historical continuity. George Sarton in his monumental *Introduction to the History of Science*[5] says, for example:

> "... The golden age of Egyptian Science seems to have occurred about the twentieth to the fifteenth century B.C., and though we know that the Greeks were influenced by the Egyptians in many ways, it is impossible to tell, with any completeness or precision, how the Egyptian lore was transmitted to Greece ...".

This gap is being plugged at a rapid pace. Grapow, *et al.,* have provided an admirable piece of historical research and so have the excavations in Crete. We must not forget that Sarton wrote this in 1927. The papyri under discussion are also important in that they discuss surgical operations, diagnosis and prognosis, the course of a particular disease, and also because of the obvious deduction that different schools of medicine existed at the time.

One papyrus describes the circulatory system and the sources of different diseases. There are other papyri which describe the mode of tranquillizing the excited organs and emollients and anodynes therefore, stimulating the inert organs, and antiphlogistic, anti-inflammatory, and analgesic medicines. Pythagoras of Samos (died 497/96 B.C. in Metapontum) and Thales of Miletos (born c. 624 B.C.) seem to have been the main transmitters of Egyptian knowledge to Greece, and the Pythagorean "Treatise on Seven" (*de hebdomadibus*) which, in all probability, is pre-Hippocratic and might have borrowed the idea of critical days (ascribed to Hippocrates by Galen) from the ancient Egyptians.

The papyri also emphasise the systematization of the symptoms, and herald thereby the discipline of medical diagnosis. The station of the god, Amon, was the highest, except for a while when the King, Ikhnaton, raised the god, Aten, as the supreme and unitary godhead. Like all ancient civilizations, the Egyptians also regarded the gods as intercessors in health and disease. The god of medicine was Amhotep and houses of worship, hospitals, and monasteries were dedicated to him. The Egyptians accorded prime importance to respiration, and disturbed breathing was

regarded as disbalanced circulation of the blood. The blood was regarded as a most important regulatory substance; the heart was believed to be the centre of the venous and arterial systems. The circulation of the blood was scrutinized by touching the head, hands, and legs with fingers.

A very important aspect of the Egyptian age was the fact that the exponents of the Egyptian medicine seemed to have been dimly aware of the parasitic nature of bacterial and bacillary diseases. This was arrived at by induction. We know today for certain that many diseases in the hot countries of the world are caused by microorganisms. Diseases requiring non-surgical treatment were classified into four kinds: those due to magic, flatus, the planets (astrological), and the weather (meteorological). But, as the cause of a disease, the parasitic organism enjoyed precedence. The people of Egypt were mostly victims to diseases of the skin and the eye[6], and were very circumspect against the external and internal organisms. The extant papyri describe these agents of disease in detail. The flatworm causing bilharzia even today is a major epidemic factor. The mummies can also provide a clue to many of the prevalent diseases.

The extant papyri spreadeagled over several dynasties show in ample measure that the physicians of ancient Egypt knew the art of diagnosis. They could gauge the extent of an ailment from the pulse, sight, hearing, and touch and could often pinpoint – although the aetiology of a disease was, of course, based upon the rule of thumb – the cause behind a disease.

Treatment in ancient Egypt was based upon a blend of faith and reason. There is every reason to believe that the origin of treatment had its roots in reason and common sense. Magic and shamanism gained precedence only later on. It could be due to the supplanting of the unitary godhead, Aten, a transmogrified form of the sun god Re or Ra by Amon, and the subsidiary gods, and also because the common people could not distinguish the symbolical and mythological from the rational[7]. Greece and Iran underwent an analogous process[8]. The Egyptians knew different herbal, animal, and mineral drugs, as also that of suppositories, clysters, and ointments. In Africa circumcision was practised rather commonly, and even girls were circumcised.

Preventive medicine had attained a very high-water mark in the realm of medicine in Egypt. The Egyptian civilization had the elements of medical ethics. This is testified by the burial rites, cleaning of households, the kinds of victuals required in a nutritious diet, and sex life. The daily chores of life were subservient to religious law. The religious code was also, to a great extent, moulded by medical' ethics. In short, medicine in Egypt was dependent upon empiricism, reason, and spiritualism. It is not easy to distinguish between the religious and hygienic principles in Egypt.

The Egyptian ordinances in respect of bodily cleanliness were rather strict to the point of harshness. It was necessary for an Egyptian to bathe twice in the day and twice in the night, to get his face shaved every third day and to have his hair shaved after a fixed period. Only white apparel was permitted and abstinence from the swine's flesh and fattening diet was enjoined upon. Water could be used for drinking purposes only after boiling and sieving. Abortion, carelessness towards the hygienic environment of the children, and copulation during menses were strictly prohibited. Onanism was regarded as a shameful self-abuse. Only loose cotton clothes were allowed. A child, after being weaned, was kept on the cow's milk and given vegetable and fruit juice. Egypt had attained an amazing degree of perfection in the preservation of the dead and even today's man with all his knowledge of chemistry cannot but be amazed at the Egyptian attainment.

Physic was kept penned by specific laws. Specialization was a *sine qua non* and each physician could only treat specific kinds of diseases. Added to it stands the fact that physicians in ancient times enjoyed a very respectable and privileged position. They were held in precedence over the scholars and the learned. The different schools of physic which flourished were managed efficiently and yet were independent in arriving at their own conclusions and devising their own methods. Some schools had hospitals attached to them.

During the brief occupation of Egypt by Iran, physic also underwent a decline along with the other walks of life. Two great citizens of Pergamum, Galen and Oribasios, and Paulos Aegineta, alive at the time of the Arab conquest of Alexandria, drew upon the compost provided by the ancient Egypt. Babylonia and Assyria also grew during the intermediate age of Egypt's progress, but, as compared to Egypt, the influence of the latter two is inferior, partly because of the shorter durations enjoyed by them and partly because they did not have the long life of the Egyptian civilization.

The Babylonian and Assyrian Physic

Babylonian physic had its birth 4,000 years before Christ in Southern Iraq. What was known as Mesopotamia or the region between the Tigris and Euphrates came to be later known as *Al-Jazirah Al-'Iraq.* All the civilizations that sprouted from the alluvial soil of Iraq had the leaven of religion in them. This is writ large in the Code of Hammurabi and the *Gilgamesh Epic.* A detailed study of the subject was undertaken by the late Martin Levey (*Chemistry and Chemical Technology in Ancient Mesopotamia;* Amsterdam, 1959) and B. Meissner (*Babylonian and Assyrian;* Heidelberg, 1925, 2 vols.), to name only two works. Levey in

his works has particularly emphasized the continuity provided by the Sumero-Akkadian and Aramaic cognate synonyms of drugs. Monumental works in this direction are R.C. Thompson's three books – *The Chemistry of the Ancient Assyrians* (London, 1925), *A Dictionary of Assyrian Botany* (London, 1940) and *A Dictionary of Assyrian Chemistry and Geology* (Oxford, 1936). To quote only one instance, the aloe plant known as *Sabir* in Arabic was known as *Siburu* in Akkadian.

Excavations have revealed that the Aegean Islands, Asia Minor, the Fertile Crescent, and Egypt had reached a very high stage of progress 2,000 years before the efflorescence of the Greek culture. It is but natural that there should have been in existence some kind of channel establishing within that diversity a common *weltanschauung.* What later emerged as the Greek civilization was a compost of these cultures. Discussing the *Gilgamesh* the authors of *Before Philosophy* state:

> "... Death, considered with some detachment as a state of being, is viewed as a substance inherent in all who are dead or about to die. But death considered emotionally is an act of hostile will.
>
> The same dualism occurs in the interpretation of illness or sin. When the scapegoat is driven into the desert, laden with the sins of the community, it is evident that these sins are conceived as having substance. Early medical texts explain a fever as due to 'hot' matters having entered a man's body. Mytho-poetic thought substantializes a quality and posits some of its occurrences as causes, others as effects. But the heat that caused the fever may also have been "willed" upon the man by hostile magic or may have entered his body as an evil spirit[9].

So here we have the basic concept of the humoral theory It has been further averred:

> "The common mother of gods and men to whom Pindar refers is Gaea, the earth; and the earth, as Ninhursaga, was often regarded as the Great Mother in Mesopotamia. Homer still knew of the primeval waters: Okeanos from whom the gods are sprung. Yet more important than such echoes of the Near Eastern beliefs is the similarity between the Greek and the oriental methods of interpreting nature: an ordered view of the universe was obtained by bringing its elements in a genealogical relationship with one another[10].

This should substantiate our contention that the Hippocratean schools of medicine represent a quintessence of the different factors that coalesced into it and gave it a "habitation and name." The Arabs, as successors to

the Greco-Roman civilization, helped to continue this tradition and, with documentation and preservation of records, gaining greater permanence and importance. Classical tradition reached them through both books and practice, especially via Syria and Egypt after the conquest of these lands during the Caliphate of 'Umar Ibn Khattab. The Arabs as Muslims followed the *ahadith* of the Holy Prophet (ﷺ) enjoining upon the Muslims to be athirst for acquisition of knowledge and they displayed a remarkable degree of integrity, giving credit wherever it was due and withholding it wherever they thought it was not due The Arab, for instance, was prepared to wash the feet of the Greek Master insofar as knowledge was concerned, but he would not prefer the Greek language to the language of the Qur'an.

Greek physic was influenced more by the Egyptian than the Babylonian and Assyrian. One reason for this is the greater geographical proximity between Egypt and the Aegean Islands. We have already spoken of the Minoan factor. But the fact is that the Babylonian physic was, even though it was under the influence of superstitions, no different from the Egyptian in evolution. The Babylonians knew surgery and even operated on cataract. All the ancient physic have in them the elements of circumcision, the use of poultice, bath, and massages and many of the drugs used in Egypt were used in Babylonia also. The latter knew the use of the horn of the male mountain goat and the powder thereof, as also of bleeding, and like the Egyptian physic, the Babylonian physic also changed with times.

While it is impossible to determine whether the Nile or the Euphrates valley civilization is the older, some historians have veered to the view that Mesopotamia represents the oldest civilization. The physic of this civilization was largely shamanian and basically religious. Astrology particularly gained ascendancy among the Chaldeans and the fertility rites emphasized the importance of weather in the sustenance of man.

The foundation of the civilization that we associate today with the valley between the Euphrates and the Tigris, commenced with the Sumerian civilization which flowered between the fourth and the fifth millennia before Christ and lasted for about two thousand and five hundred years. The Sumerians were followed by the Akkadians. Assyria was to the north of Akkadia in the vicinity of Mosul. The region that we know as Chaldea was situated between the Euphrates-Tigris delta. The famous Kuyunjik Collection pertaining to the Assyrians in the British Museum has parts of the records of the royal library of the greatest Assyrian monarch, Ashurbanipal. This library was in Nineveh. It contains about 25,000 tablets. This collection is at the base of our knowledge about Babylonia. It appears that the Babylonian physic had an edge of over

4,000 years over the Greek and the determination of one's sickness or health was geared to a mythological framework.

One must, however, bear in mind the fact that the civilization of the Tigris-Euphrates valley embodied within it the magical, the scholastic, and the empirical. Tablets describing the malinfluence of evil spirits display this aspect plentifully. This remarkable contribution relates not to medical texts alone, although medicine plays a major role in it.

What the Babylonian and the Assyrian texts show is that the people of the region had attained considerable progress in medicine. The Assyrian medicine embodied the early knowledge of the Akkadians and were during the efflorescence of the Babylonian-Assyrian civilization more advanced than the Egyptians. The Assyrian proficiency was not the result of the supremacy of Assyria over Babylonia but of gradual progress.

The tablets which have passed 'on to us indicate that the physicians had a very high status in the society, they had attained a high degree of proficiency in diagnosis and the ability to identify and deal with the syndromes. They also knew that certain symptoms make a collective appearance. The purpose of diagnosis is not, according to them, to identify the disease but the nature, aetiology, and the location of the ailment, and therefore, what appeared as a disease was examined from all facets.

The *materia medica* of the Euphrates-Tigris valley embraced the mineral, animal, and plant kingdoms. The basis of many prescriptions was exorcism, and the aim was to expel or conquer the evil spirits. Empiricism and shamanism or magic were often intermixed. For example, in the treatment of hair, the recipe comprised the galls of the black ox, scorpion, the wild raven, stork, opium, and other ingredients. The approach was to exorcise the evil spirits and the more chronic the disease, the more rigorous was the regimen prescribed for the remedy, leading to the principle of the cure of the similar by another similar. This principle is at the heart of homoeopathy. Baldness among women was treated by means of amulets, charms and medicines; the same was true of the diseases of the eye.

Asthma seems to have been common in the ancient Iraq and diseases relating to respiration have been described in detail in the tablets that have reached us. One tablet describes the inflammation of the intestinal muco-membrane in great detail; the same goes for phthisis. These tablets in short, represent a synthesis of the superstitious and the experimental, and both were applied in the aetiology and treatment of a disease. The diseases of the stomach and the intestines were held to be the mothers of all diseases and the formation of calcareous deposits – soft and hard – could be ascertained.

The people of ancient Iraq had a very extensive knowledge about minerals. They knew the liquid tar, yellow amber, tutty, borax, coral, red clay, burnt copper for the eye, etc. The medicines were triturated with

a pestle in a mortar. Liquid medicines were poured into concentrated vinegar or wine. Pure wine, date wine, non-clarified wine, and crudely distilled wine were employed as vehicles like milk and were also used in the preparations of recipes. The main vehicle for compounded medicines was wine.

Fumigation with odoriferous herbs was quite common in respect of lung diseases. Excreta of the dog, fox, jackal, and deer were incorporated quite frequently into medicines and fumigation with them was resorted to when exorcism of the evil spirits was desired. The Assyrians had an instrument for measuring the respiratory rate. All the ingredients were placed together, a pipe was inserted in the mixture, and the vessel containing the mixture was coated with wheat flour and heated on fire. The pipe was then put into the mouth of the patient. Clyster and bougie were employed in ailments of the rectum, while in urinary ailments, medicines were carried into .the urinary tract by means of a zinc pipe. Douching and rubbing of oils were quite common.

The Code of Hammurabi has set out laws governing medicine. According to the Code, the physicians were to charge prescribed fees and surgeons were to be appointed for the armed forces. Laws relating to the surgeons were particularly stringent, and the historical value of these laws is indeed beyond any price, as they herald the dawn of medical jurisprudence.

The great value of the Code of Hammurabi lies in the fact that it bears with it the elements of medical ethics of a very high order. The physicians were accorded very reasonable rewards and severe punishments for negligence were prescribed. The man of physic in Babylonia was subject to laws and each physician was supposed to carry a kit with him.

The laws of the macrocosm and those of the microcosm, in the Babylonian view, were interrelated and the laws of the celestial bodies were applied to the bodily changes. This concordance resulted in the crystallization of a religion, whose peculiarity was that it was very strongly tied with the celestial bodies. The basic idea was that just as the stars influence the forces of Nature, the sun is the fountainhead of life, the tides are governed by the changes in the brightness of the sun and is linked especially to the moon, in a like manner the humours of the body and the bodies themselves are influenced by the heavenly bodies.

The influence which the sins were supposed to exercise upon the heart and the psyche, made the system practised in Babylon psychosomatic and even the conquering Iranians who laid low the Babylonian empire in the 6th century B.C., could not help being influenced by the vanquished.

Alexander's stay in Babylon in 331 B.C., made the city hum with life, but his death eight years later extinguished the prospect of its being the Asiatic centre of the Greek civilization.

The Iranian Physic

The Avesta is the basic structure on which Zoroastrianism is based[11], and like the Old Testament it also has medical texts. The duality of the good and the evil, already apparent in the Assyrian-Babylonian civilization, attain a degree of intensity that is characteristic of the Iranian ethos, first in the form of the Spenta Mainyu-Angra Mainyu duality and later in the Ormazd-Ahriman duality. The element, therefore, of purification from the influence of the evil forces predominates in Zoroastrianism and the latter-day Zurvanism of Mani (the light-darkness duality) only etches out this duality of the good in tussle with the evil.

The original Iranians, an Aryan people, were primarily pastoral and observed laws that resembled those prevalent in India. The leprous were, for example, kept away from habitations and severe laws were in force on this score. Treatment incorporated invocations and prayers and purification rites in which the *haoma* or *soma* plant (probably *Ephedra pachylada,* Boiss.) played a major role. The Gathas, which constitute the oldest part of the Avesta, bear certain linguistic similarities with the Rigveda and, therefore, held to have been written during the first millennium B.C., the general consensus, however, is that Zoroaster was born during the sixth century B.C.

In ancient Iran, practice was allowed to a physician after he completed his full course, and negligence or remissness on his part was severely punished. As in the Code of Hammurabi, the physicians had their rates fixed. Burial was prohibited; the corpse was left in a walled graveyard to be eaten by the vultures. This method still continues among the Parsis of today. Funeral pyre is equally prohibited, for fire represents the principle of good and is holy.

The *Shah Namah* (by Abu-l-Qasim Firdawsi) was completed by 999 A.D., and, although it is a narrative tale, it does represent the collective unconscious of the Iranian culture. With regard to medicine, for example, it paints the high degree of progress which the Iranians had attained with respect to guarding women against miscarriage. A douche of bovine urine was given in the event of abortion and many abortefacients were known to the Iranians. Criminal abortion was a severely punishable offence, and cohabitation during pregnancy was prohibited. Caesarean section, by keeping women, "bemused" with wine during the obstruction of childbirth, also finds mention in the *Shah Namah.*

Recently much light has been shed upon Iran's contribution to medicine

during the second half millennium B.C., when the Iranians, having subjugated the mighty Nebuchadnezzar of Babylon, vanquished Assyria. They must have picked up considerable knowledge of medicine from the vanquished. The Avesta or the Zoroastrian Book of Revelation comprises the Yasna, and Yashts, and the Vendidad. The latter two works are said to have been written by someone other than Zoroaster. The total work is spread over 21 books and a million verses.

As has been pointed earlier the basic concept in Zoroastrianism is the recurrent battle between the forces of good and those of evil. This war is likened to an ever-raging storm. Indra is in battle against Azi, the serpent, who has carried off the goddesses and kept them captive in the folds of the clouds. Thus it has been said:

> "Aryama conquers all sickness and death, just as the evil genii produce them. Rain from heaven produces plants and trees, whose properties are to cure disease and prevent death."

In the subsequent mythology, the serpent, the most puissant force of evil created by the chief evil force, Angra Mainyu, is killed by Thraetona, who is consequently looked upon as the inventor of medicine and to whom Ahura-Mazda is said to have gifted ten thousand healing plants. In another, Thraetona is regarded as one of the priests of Haoma, the source of life and death, whereas all diseases originated from Azi, the serpent; and, therefore, Thraetaona was, to a double degree, the patron of medicine, both as a serpent-killer and as the priest of Haoma.

The good-evil duality continued down to the Sassanid times. If anything, it became all the more complicated; nevertheless, it was conceded that natural physical phenomena also had a role to play in cold and heat, stench and grit, hunger, anxiety, lassitude, worry, and ageing. They were graded as diseases. Luxurious living, immoderation, and wantonness were regarded as the sources of disease. A major cause was attributed to impurities in the blood, and infection by somites was recognised. The physicians were specially instructed to observe the utmost care in not moving from one patient to the other, so that infection from one patient to another might be kept under check. The Avesta says that the embryo becomes animate during the fourth month of pregnancy. A miscarriage, howsoever caused, rendered a woman impure and imposed upon her quarantine for at least twenty paces from fire and water. The woman was given victuals but no water. She was, however, given water on the fourth day in the event of her having a fever. It was held: "... the first thing for her is to have her life saved. Having been allowed by one of the holy men, she shall drink of the strength-giving water." But the

penalty was 400 strokes. Two hundred ants were sacrificed if the lochial discharge had not ceased by the tenth day.

The abortifacient properties of certain drugs are mentioned in the Avesta. These are *banga* or hempseed, *shaeta* (gold or possibly some yellow plant or liquid), *ghana* ("that which kills"), and *fraspata* ("that which expels the fruit so that it perishes"): none of these can be identified with certainty. Care of pregnant women without guardians was enjoined and even dogs were to be guarded. The presence of the dog, in the Zoroastrian ritual, was held to be a good omen. If a dog happened to stare at an impure object, its stare was supposed to impose purification upon the latter. Besides fire, earth, water, and vegetables were also regarded as the forces of purity and their desecration was a crime. Purification was effected through *gawmish* (urine of the cow).

Apparel worn by patients who had had a contagious disease was burnt and anyone transgressing this law was subject to punitive measures. Contagious clothes were purified by bovine urine and this approach is still prevalent in the Ayurveda.

It might seem to be an exaggeration to many but the probability is that what is known today as the Greek medicinal system was largely based upon the Iranian factor. By 700 B.C., the Greeks possessed little civilization, and what flourished in the island of Crete was non-Greek. But only two hundred years later the Hippocratean system had evolved and there is much reason to believe that much of Hippocrates' vocabulary was newly made and of speciously designed nature. Even the Greeks themselves regarded the humoral theory to be exotic and of Persian origin, though by this they only meant foreign, and many of the names of the drugs are Indo-European and some are Babylonian. It is also quite probable that the Persians learnt much from Mesopotamia and Egypt and transmitted this admixture to the Greeks.

The subject of this paper is the Greek and Arab systems of medicine so that these systems may be compared with the present-day or modern medicinal system. The objective is to determine aspects on which comparative studies may be set into motion and to derive tangible conclusions therefrom. It is, therefore, essential to pinpoint the different factors that gave birth to the Greek system so that an overall appraisal may be possible. 12 Greek medicine is at the very base of the Arab system and, therefore, it is but essential to understand the ethnic components of the Greek *materia medica* and its evolution. Only when this has been done would it be possible to assess whether it is possible or desirable to retain *Tibb,* and how far the Arabs were guided by a rational approach. We find that the Hippocratean system is being given a new lease of life in the West and ethnopharmacognosy has

emerged as a new discipline, but, turning to Muslim countries we find that *Tibb* is being dismissed as an antediluvian eccentricity with an antediluvian residue. This state of affairs prevails despite the fact that the public in all Muslim countries largely takes recourse to herbal remedies and, including antibiotics, more than 50% of the drugs are of natural origin.

The Greek Physic

It was but essential that the background of the Greek system of medicine should be examined so that the various factors, that have coalesced into its making, should be broken up into different components and the composite whole analysed.

The first one-thousand-year period of Greek medicine lasted from 500 B.C., till 500 A.D. During this period, we see the Greeks freeing themselves from the shackles of the mythological, the superstitious, and the magical. It progressively gained in induction and rationalism, which are reflected in the works of Theophrastos of Eresos (c. 372-288 B.C.), Archimedes, and other scientists, and the foundations of which were 'laid by Plato and Aristotle, particularly with the latter's onslaught against the mystical nature of the Pythagorean doctrine of numbers and music. This culminated in Archimedes (287-212 B.C.), and Euclid (323-285 B.C.), the greatest scientific geniuses of antiquity.

The existence of small and independent states or principalities in the Aegean Sea catalysed the growth of free thought and speculative freedom that forged new disciplines like ontology, pharmacognosy, teleology, metaphysics, and taxonomy, to name only a few.

We have already spoken of the *Gilgamesh.* The Homeric epic, comprising the *Iliad* and the *Odyssey,* is not only treasured as one of the most major literary works of all times but also as a repository of the traditions then current in Greece and as a reflection of the Greek ethos. Medicine in the time of Homer was held to be a noble art, with the physician treated with great honour. Anatomical knowledge was, of course, primitive but was fairly exact concerning the bones, muscles, and joints. Life, for Homer, resides in the breath which is the transmitter of every vital activity and of all the passions, whilst the seat of life is in the diaphragm. The Homeric concept of after-life is not very different from that of the Hebrews: the latter had the *sheol,* the shadowy existence, while the soul, which abandons the body with the last breath, or escapes with the blood of wounds, continues to exist in Hades, where it is transported by Charon, the rower of the dead.

An epic with the broad sweep of the *Iliad* and *Odyssey* should contain, of necessity, more detailed medicinal descriptions than the

Gilgamesh, showing how the world picture had widened. The Homeric heroes, for example, know how to treat their own wounds and those of their comrades, and some of them – such as the sons of Aesculapius, whence its figurative usage for the physician – were particularly skilful in this art. In the Homeric poems we come across the extraction of foreign bodies, haemostasis, the application of compresses or of powdered roots, and the use of bandages.

This "educator of Greece" (as he has been called by Plato) lived some time during 9th and 10th centuries B.C., and doubt has been thrown upon whether a single poet wrote these two works. Be that as it may, the *Odyssey* represents a more developed and fuller outlook and carries the synthesis of the Greek race farther.

The inventor of the art of healing is Apollo (*Alexikakos,* the one who chases away all ills). Artemis (the Roman Diana) was the protectress of women and children. Hygeia was the goddess of health and Panacea was the healer of all ills. The other gods and goddesses of the Hellenic pantheon concerned with medicine are Aphrodite or Venus, the protectress of sexual life; Pan, Juno, Neptune, Bacchus, Mercury (Hermes), and the chthonic deities, Pluto, Proserpine, Hecate, even Cerberus and the Furies; they could cause or avert disease. This power could be delegated to humans also, as in the case of Adrnetus' wife, Alcestis, to whose succour Hercules came (one of the seven labours of Hercules). The Greek pantheon was also evolving: only when almost on its last legs did it accord Zeus the supremacy. The great Greek dramatist Sophocles, for instance, says:

> There was the proud Edonian King
> Lycurgus, in rock-prison pent
> For arrogantly challenging
> God's laws: it was his punishment
> In that swift passion to repent ...

The centaur, Chiron, was generally regarded as the founder and master of medicine, especially of surgery. The most famous of Greek heroes were his pupils in the chase and in the healing art. Later on Aesculapius or Asclepios, the son of Apollo, became the god of medicine. The serpent in the Biblical narrative and in the ancient Iranian pantheon represents the subterranean force and Aesculapius is undoubtedly a god of the Hellenic pantheon that predates the first millennium B.C.

The Aesculapian cult was introduced in Athens in about 429 B.C. The priests of Epidaurus sent the symbol of the god, Epidaurus, to the cities where the sanctuaries were to be established. A temple at Tiber was, for example, built in 249 B.C., at a time when plague raged in

Rome and when messengers were despatched to Epidaurus to bring back a sacred serpent. A temple at Tiber, dedicated to Aesculapius, was erected on the island of Tiber.

The Aesculapian temples were built in surroundings characterized by natural beauty and sylvan quietness. More often than not, they were built near the sea so that the fresh breeze from the sea might act as a salubrious influence or in places abounding in baths of mineral waters. Later on, complexes comprising magnificent theatres, gymnasia, stadia, and even hippodromes were erected around them. Here the chronic patients were subjected to gymnastic and callisthenic treatment, baths, and in unctions. The patients were also furnished with residential quarters.

Purgation or *Katharsis* is a characteristic feature of the Greek ethos, and, therefore, all those who were admitted into the Aesculapian sanctuaries to invoke the intercession of the god, underwent a preliminary treatment. This treatment was purgative in every sense of the word, and its regimen consisted in a series of baths and abstinence from wine and certain kinds of food. Only after undergoing this preliminary regime were they admitted to the temple and to begin a dietary regime lasting several days. This regimen was followed by the sick being admitted to the ceremonies of the cult, in which the priest invoked suggestive prayers, accounts of former cures, and so on. Lastly, the patients were made to spend one night or more in the *abaton* (the *abaton* was constructed in the 4th century B.C.) temple at the feet of the statue of Aesculapius, where they awaited the healing dream. It was then that the priest appeared in the night in the mask of the god; he was accompanied by the priestesses of the temple and accomplished various medical treatments. It was customary, after treatment, to dedicate to the god an anathema, a plastic representation in gold, silver, or marble of the part cured, or, alternatively, money was thrown into the sacred spring.

The Greeks and the Romans were characterized by the "additive-god feeling." And, therefore, it was permissible for them to follow local traditions and to incorporate minor deities. The Roman god, Mithra, for example, is a Persian deity transported to Rome. But the essential part of all such practices was the dream or hypnotic state, analogous to the soma plant of the early Hindu-Aryans or the haoma plant of the ancient Zoroastrians, which also induced hypnosis. Priestly medicine was widely practised by 500 B.C., and continued to be in practice by the 5th century A.D. By this period Christianity had become the staple religion of Greece and Rome, and yet we find the cult of Aesculapius often mingled in a combination with the cult of Christian saints.

The dawn of scientific medicine is in Greece with the efflorescence of the pre-Socratic Ionian school. The history of Miletos, where' the Ionian culture and school of thought originated, has been chronicled by

Cadmos of Miletos, the oldest historian about whom some information is available, and who belongs to the age of two other great contemporaries, Thales and Pythagoras, in the middle of the 6th century B.C. He is attributed four books on the history of Ionia and the foundation of Miletos.

The founder of the Ionian school, properly speaking, Thales of Miletos (born c. 624 B.C.) concerned himself with mathematical problems viewed from the cosmic standpoint. The concept of *physis* or that of nature, which was developed as *natura naturans* by Plato and *natura naturata* by Aristotle, is, in all probability, due to Thales. He also lays the principle of biogenesis, namely, that some thing must come out of something and that, therefore, there must be a substance that is the original principle of everything in the cosmos and of the cosmos itself. This original substance, in Thales' thought, is water, whereas modern science holds it to be hydrogen, showing how close Thales was to the root of the problem. It is not water in the sense of a divine substance, as believed in the ancient cosmogony, "but water regarded as an essential fundamental substance and logically demonstrable in every living being," It is from water or its transformed forms that everything is derived: the fertility of seeds and the life of all living beings, whether plants, animals, or man. All life begins with water (the modern theory is that life originated in water) because everything that is corrupted or dies is transformed into liquid, i.e. water. It is also probable that Thales laid the distinction between form and spirit: the latter is a motive or driving force and distinct from the body.

Thales, whose writings are not extant, generated a new spirit of activity and speculation. Anaximander, also of Miletos (c. 610-545 B.C.), is credited with the first ever exposition of organic evolution, while his short-lived pupil, Anaximenes (d. 528 B.C.), even went further by holding air to be the principle of all things. Development, he held, takes place by thickening or thinning. In other words Anaximenes visualised not only the first principle but also a process of evolution. Xenophanes of Colophon (flourished about 540 B.C.), is credited with being one of the founders of geology with his correct interpretation of fossils.[13] He is also one of the founders of monistic philosophy from which pantheistic monotheism of the Platonic school derives.

Pythagoras, together with Thales, one of the Seven Wise Men, was a physician besides being a mathematician and is the father of the theory of numbers. He is the first to note the relationship between musical pitch and the weight of the hammer and the length of the cord, and to establish the doctrine of perfect numbers. From this theory of numbers or, more properly, the theory of harmony Pythagoras derived the concept of the universe as being in perfect numerical harmony and also the Hippocratic concept of the crisis, the critical days, and nature-cure. Pythagorean

philosophy led, on the one hand, to number mysticism and, on the other, to a quantitative study of nature.

Alcmaeon of Crotona, a younger contemporary and perhaps the disciple of Pythagoras is the greatest of Greek pre-Hippocratic physicians and is indeed the father of Greek medicine. He was the first to make sections, discovered the optic nerve, distinguished in the cadaver empty veins and veins carrying blood, and knew the trachea. He explains the phenomenon of sleep, the origin of sperm and sense impressions, and conducted physiological explanations. Alcmaeon recorded further advances in thinking. In postulating his theory of *Isonomia,* that is, the perfect harmony of the substances composing the human body, he might well be the precursor of the metabolic theory of today, for, according to him, *disease is nothing but an expression of a disturbance of this harmony.* Cure, therefore, consisted in the restoration of this harmony. It was from this direction of thinking that the principle of humoral pathology was evolved. He also sets another milestone. It is the brain, and not the heart, that is the seat of the senses.

Empedocles of Acragas (Agrigentum, Sicily), born about 490 B.C., died in the Peloponnese c. 435 B.C., is one of the world's major figures in philosophy, science, and medicine. It is he who visualized the existence of the four elements or roots of earth, fire, air, and water, and of two moving forces, love and strife. He also postulates the process of synthesis and analysis or of build-up (anabolism) and disintegration (catabolism), depending upon which force predominates. He experimentally proved the corporeality of air, discovered the labyrinth of the ear, and was the first to formulate a theory of the flux and reflux of blood from and to the heart, with these tides constituting the respiratory rhythm. Respiration takes place not simply through the lungs but through the whole skin. He is among the first to emphasise the importance of blood vessels, blood being the carrier of innate heat.

The discipline of oneirology or the science of dreams was, properly speaking, founded by Democritos of Abdera (flourished c. 420 B.C., born 460 B.C.), who explained "dreams as being due to the influence of simulacra of other beings or objects upon the soul of the sleeper[14]." This was the basis of the shamanic treatment in which liberation from the earthly sphere is induced by natural drugs. Ethnographic study of drugs the world over has almost established this fact.

And now we come to Hippocrates, justly called the "Father of Medicine" (*abu al-Tibb*). He was born just before the age of Plato and that of Aristotle, and in other words, his was the age of Herodotus of Halicarnassus, Sophocles, Euripides, Aeschylus, and the great statesman, Pericles, whose age is regarded – and rightly so – the golden age of Athens. And the foundation of historical writing was laid by Thucydides,

whose history of the Peloponnesian War has been called by the great classical scholar, Benjamin Jowett the *"re plus ultra* of the human art."

Born at Cos (c. 460 B.C.), Hippocrates died at a very old age in Larissa, Thessaly and within the time he passed on earth he had medicine transformed from the mixture of the empirical, pseudo-scientific, and superstitious into science. During the medieval period in Europe he was regarded, by common consensus, as the Father of Medicine. From 50 to 70 books were attributed to him, and in the third century B.C., they were collected in Alexandria into the Corpus Hippocraticum. There are parts that owe their provenance to different writers in different ages and schools, others that are due to Hippocrates himself, and some that have come from Polybos[15] his son-in-law, who was very close to him. The chief contribution of this greatest physician of all time would be that he collected data and conducted experiments to show that disease was a natural process, that its symptoms were the reactions of the body to the disease, and that the chief function of the physician is to aid the natural forces of the body in overcoming the metabolic imbalance within the body. But this is not all. He established medical deontology or medical ethics which is reflected in the Hippocratic oath today, the first principles of public health, principles of *vis medicatrix naturae* and expectant therapy "tempered by common sense". His surgery – and this is a remarkable fact – in some respects was unsurpassed till the 19th century, (particularly in respect of dislocations of the hip, shoulder, and jaw).

The basic principle of the Hippocratic four-humour theory, which had been postulated by Pythagoras, was that the body is composed of four elements – air, earth, water and fire – uniting in the composition of the single parts of the organism. Since each of these four elements possesses its particular quality – dry, cold, wet, or hot – the unitary parts of the organism also possess their essential quality.

Heat or vital force is at the basis of life. But, since it pervades the entire body and maintains itself in equilibrium, it is essential that *pneuma* should penetrate to it. The left heart is the seat of heat, and it is from the heat that the organs and the humours are formed from the nutritive substances. The blood which is collected in the liver carries the necessary heat to the left heart in a constant flow. The *pneuma* (from *pneo,* to breathe) which is the ancient version of the present-day process of oxygenation, reaches the blood via the trachea or, according to some writers, through the arteries. It passes through all the veins of the body and has been tasked with the maintenance of a proper balance, especially with regard to such organs as excrete liquid.

Human body has in itself blood, phlegm, yellow bile, and black bile; all the four humours go to make up the nature of the body, and it is through these that he enjoys health or feels pain. Good or perfect health

means the proper compounding of the four humours: the excess or scarcity of anyone of them leads to disease. Disease or pain can also be caused by the isolation of anyone of these humours without being compounded with all the others. It is obvious, that, on this analogy, when an element is isolated by itself, not only must the place, which it has left, become diseased but the place where it has become logged must, because of the excess, lead to pain. When there is more of a humour than is necessary to get rid of superfluity, the emptying causes pain. If, on the other hand, it is to the inward part that there occurs the emptying, the shifting and the separation from other elements, the man must, according to this theory, suffer from double pain, one in the place left and the other in the place flooded.

The humoral theory, expanded by people like Polybos, Diocles of Carystos, Erasistratos (who enjoys the distinction of being the pupil of Metrodoros, the son-in-law of Aristotle), and Herophilos, to name only a few, does not stop with the establishment of the four fundamental humours but assumes the shape of a very important generalization, viz., that of the reciprocal relationship between various organs, the so-called interhumoral "sympathy." "Everything is founded on a united confluence of all the four humours, a united concordance, a united sympathy." Hippocrates also virtually founded the twin disciplines of pathology and the aetiology of diseases by relating to disease the dominance of the humours according to the seasons and the resulting changes in this dominance with regard to the origin of certain diseases.

As should be expected, Hippocratic pathology is humoral. Nevertheless, by emphasizing the role of the humours, Hippocrates removed the aura of supernaturalism which the earlier-day physic had as a built-in part of its system. Blood which comes from the heart represents heat. The phlegm, which, according to the major opinion, comes from the brain and if diffused through the whole body, represents cold. The yellow bile, which represents dryness, is secreted by the liver. The black bile which represents wetness comes from the stomach and the spleen. The Pneumatists and others held blood to represent the moist, hot humour; phlegm the cold, moist humour; yellow bile, the hot, dry humour; and black bile, the cold, dry humour. Thus the basic framework of Hippocratic pathology is harmony or a proper blending or compounding of the humours representing health, whereas disharmony is dyscrasia – which can be brought about by various factors, congenital, accidental, and natural phenomena. Dyscrasia is the equivalent of today's pathology.

Nature, according to this concept, is the bodily resistance or resilience. The greater the resistance or the power to maintain harmony, the less possibility will there be of dyscrasia. The resisting force of the body, when overcome, results in dyscrasia or change in the crasis

(harmony). Dyscrasia manifests itself with clearness in the acute diseases. The heat seeks to dominate the wet humour by changing or eliminating its essence, and the Hippocratic explanation of the different stages of disease is as follows:

i) *Apepsis,* the stage of crudity, the *materia peccans* bringing the humour into a raw or crude stage.
ii) *Pepsis,* maturity or coction of the disease;
iii) *Crisis,* the decisive struggle between nature and disease.

The last stage – that of *crisis* – is, according to Hippocrates, characterized by an increase in secretion, by the passage from one form of fever to another *(metastasis),* and often by delirium.

Modern scholarship has almost, through textual, stylistic, and linguistic comparisons, established the following to be genuinely Hippocratic works:

1. **The Sacred Disease:** In this work Hippocrates established epilepsy to be a disease of the brain, not of the heart or the diaphragm.
2. **Airs, Waters, and Places:** This is the first major and clearly presented work on the importance' of meteorology, climatology, and astronomy from the medical point of view. It explains climatic and geographical influences upon organisms and upon the causation and spread of diseases. Sarton calls it the first treatise on medical geography and also one of the first geographical introductions to history.

   The second part of the book is ethnographical rather than medical and is the first anthropological work.
3. **On Diet:** It deals with diet and exercise, and contains the first scientific treatment of animals, besides general views on evolution and biology.
4. **On Wounds of the Head:** A very scientific treatise containing descriptions of various kinds of skulls (e.g., variations in the sutures), it also embodies the theory of fracture by contrecoup.
5. **Prognostic:** Which deals with the prognosis of acute diseases.
6. **Regimen in Acute Diseases:** It is a supplement to the last and discusses diseases characterised by high fever, chiefly chest complaints.
7. **Epidemics I and III:** W.H.S. Jones, the editor of the Greek-English edition[16] calls these two books, making a single work, "the most remarkable product of Greek science."
8. **Ancient Medicine:** The book is a defence of the empirical study of medicine against the *a priori* method or medicinal system based upon preliminary axioms.

We have earlier mentioned the influence of Pythagoras upon Hippocrates. Both the theory of the four humours and the doctrine of the crisis bear the Pythagorean stamp. It is the Pythagorean numbers that determine the days or the periods in which crisis occurs. Ordinarily the periods were said to be of three or four days but changes in the periods were often recognized.

Although, in the succeeding age – that of Plato – probably bodily dissection was attempted, Hippocrates' knowledge was based on experience with animals. Hippocrates displays remarkable knowledge about the bones, but is comparatively poorer in his know ledge of the other parts of the body. It seems that the examination of cadavers was almost unknown in his time. But his achievements in bone surgery were remarkable. Nerves and tendons were often confused with muscles and often with blood vessels; ideas about the thoracic and abdominal organs were vague, although these organs were named and sometimes described. Arteries were said to contain blood because they were found to be empty after death. The word, "veins", signifies the vessels that carry blood. Knowledge of the precise role of the heart, and the part it plays in the circulation of the blood, is uncertain, and some Hippocratic books state that the veins carry blood to the head.

The uterus, according to Hippocratic writers, is always bicornate. The males are conceived in the right and the females in the left side. Fertilization is held to be the mixture of the male and the female seed.

The brain, for the first time, is accorded its true position in being held as the centre of thought and will and, therefore, of consciousness. It is a gland that collects the excess liquid from the body. It is also the centre of sensations and, therefore, of the nervous system; in other words, it is the basis of life, and consciousness is the result of a functioning brain, not of the heart. Sight is thought to be the result of the formation of the image on the pupil, and the bones of the ear carry the auditory sensations to the brain. Diseases were attributed to errors in diet or to special meteorological conditions.

The Hippocratic system of pathology classifies the various diseases according to their principal symptoms and thus, among the febrile diseases, malaria was known, and so were quotidian, tertian, and quartan fevers.

Nasal catarrh, laryngitis, and pneumonia, sometimes, confused with pleurisy, are described in Hippocratic writings. The origin of pneumonia is attributed to the phlegm which, descending from the head, is transformed into pus and can lead to empyema or clots of blood or phlegm, from which tumours (tubercles?) can be formed. The question whether *phymata* really signify tubercles has been discussed, but it, all the same, seems that Hippocratic writers knew tubercles and that cavities could be formed from them. Pleurisy is regarded as a disease coming from pneumonia

and actually from contact of the lung with costal pleura. Collection of pus in the thorax and, therefore, also tuberculosis are included with empyemata or pulmonary abscess.

Phthisis is generally considered to be the result of hemoptysis and its principal symptoms are described very clearly and lucidly. The close relationship between this disease of the lungs and disease of the larynx was known to the Hippocratic school. The characteristic temperature, the appearance of the sputum, the loss of hair, and diarrhoea, which was regarded as a fatal symptom, are phenomena described with remarkable accuracy. The contagious nature of pulmonary tuberculosis is also explicitly mentioned.

Diarrhoea, dysentery, ileus due to masses of indurated faeces, etc., are noted among the diseases of the intestinal tract. Cirrhosis of the liver, mumps, diphtheria, erysipelas, gout, puerperal sepsis, and cancer are among the diseases recognised by the Hippocratic school.

Diseases of the nervous system, which are held to be due to the loss of the phlegm from the brain, result in the nerves becoming dry and lacking in the proper amount of humidity. It is thus that epilepsy, paraplegia, tetanus, apoplexy, and convulsions are explained. It was thus that Hippocrates combated the notion that epilepsy was a "sacred disease". All the diseases in which hallucinations or delirium were manifested were grouped under the word, *phrenitis* (from *phrenos,* the brain; meaning inflammation of the brain).

The Hippocratic school believed that divine forces, while influencing the natural forces, never interceded directly. Thus the sun, shade, climate, the wind, waters and their vapours, heredity, irregularity of the secretions, and so on, all played their roles in determining the nature and course of a disease.

Cure, in the Hippocratic concept, is closely connected with riddance of the *materia peccans.* Treatment should be deductive; that is, it should be drawn from observations of the signs and symptoms, and should tend to aid and regulate the work of nature. It is the duty of the physician to properly intervene at the right moment, at times proceeding according to the principle of "similia similibus," with the aim being to produce results similar to the symptoms. It is through his cooperation with nature that the physician turns disease to health.

The Hippocratic school was not the only one to use the principle of "similia". The *Aphorisms,* for example, state:

> "All diseases due to plethora should be treated with purgatives, and those due to excessive evacuations should be treated with repletion; in general also in other diseases one should employ contraries."

Further it is said:

> "Pains can be cured with means that are contrary to their origin; every disease has the special remedy."

Hippocratic therapeutics, as should be evident, were characterized by flexibility.

Great importance, in order to build up the bodily resistance, was attributed to diet, gymnastics, exercise, massage and sea bathing. Nourishment should be, however, lessened when the disease is at its highest. Liquid diet is recommended in fevers and wounds. Blood-letting was rarely prescribed by Hippocratists but more frequently by the Cnidian school. This was based on scarification or cupping. The cups were made of glass or metal.

This is not the place to discuss in detail Hippocratic *materia medica,* except to say that it forms, together with that of Theophrastos. Dioscorides, and Oribasios the linchpin of Arabic *materia medica.* Thus among the purgatives are listed milk, especially large amounts of asses' milk, decoctions of melon, cabbage, and other plants, often mixed with honey; and among the more drastic remedies were the black hellebore, castor oil, and colocynth. Hot water, white hellebore, hyssop, the root of the thapsia or the Drias plant etc. were recommended as emetics; hot drinks as sudorifics; the juice of scilla, celery, parsley', asparagus etc., as diuretics; belladonna, mandragora, jusquiam, opium etc., as narcotics; and oak bark, sanguis draconis (or the dragon's blood), grenadine etc., as astringents.

Armamentarium of the drugs with respect to external remedies was especially enlarged and among the remedies prescribed were water, vinegar, olive oil, wine, etc., applied in compresses, irrigation, and in the treatment of wounds. Various fatty substances were employed in the treatment of diseases of the eye; minerals like sulphur, asphalt, and alum were employed as fumigants; while preparations of lead, copper, and arsenic were pressed into service for different skin diseases. Hippocrates was all too aware that the physician is but the servant of Nature, and, if the latter resists, "all measures are in vain."

Now, in retrospect, the greatest contribution by Hippocratic medicine – indeed, the greatest in the history of medicine – is to relate the cause to the effect and to discover the points of similarities in the classification of diseases and thereby placing diagnostic treatment on sounder lines. Although as should be expected, the knowledge of anatomy possessed by this School was scant, nevertheless this was largely compensated by the accuracy of observation and profundity of reasoning. Hippocrates' attack was double-pronged; he freed medicine from the

surcingle of superstition on the one hand, and, on the other, from philosophical speculation. For him the only goal was the cure of the patient and, for this reason, Hippocratic medicine is essentially individualistic. Further, he conferred upon it an ethical outlook which is reflected in the form of the Hippocratic Oath; the latter covers the duty of the physician to his teacher, his pupils and his patients.

Let us go over five centuries down from Hippocrates and see what Galen or *Jalinus,* as he is called by the Arabs, has done for medicine. Many notable Arab figures have taken Galen as the model of what a man should be. Galen represents Greek learning in the Roman age. Born in Pergamum, in Asia Minor in 129 A.D., he died at the age of 70, and was a very prolific writer. He was an anatomist, (and in this he filled many a gap left by the Hippocratic school), physician (the greatest after Hippocrates), and philosopher (perhaps the greatest philosopher of medicine who ever lived).

The contribution of Galen to anatomy would be, by any measure, outstanding. He dissected many animals, although very few human bodies, and discovered a large number of facts in anatomy, embryology, physiology, pathology, therapeutics, and pharmacology, conducted experiments on the mechanisms of pulsation and respiration, the function of the kidneys, the cerebrum and the spinal cord at different levels. It was he who experimentally proved that the arteries contain and carry blood, and that "it suffices to divide even a small artery to drain away all the blood of the body in half an hour or less." The right auricle, he discovered, outlives the rest of the heart. To oneirology his contribution is equally great. He gave a physiological interpretation of dreams and possessed some notion of their medical significance.

Galen is the author of the four-humours theory as it operates in Greco-Arab medicine today with his postulation of the sanguine, choleric, phlegmatic, and melancholic humours.

The Greco-Arabic System

The Arabs, after being graced with faith in One God and His Prophet, Muhammad (ﷺ), chose the Greek system as the anvil on which to forge the tools for further progress, particularly as the latter was the most developed of medical systems, and occupied the position in medicine that Islam occupies in revelatory religions. This medicinal system in Europe is correctly designated as Arab medicine, although in the Indo-Pakistan subcontinent it is known as the Greco-Arab system. What is known as Arab medicine is compounded of, actually speaking, many *materia medica:* North African, Egyptian, Iranian, Greek, etc., and has even drawn upon the Indian and Chinese sources.

Insofar as its basic framework is concerned, it is based on the four-humour theory of Hippocrates which presupposes in the body the presence of four humours: blood, phlegm, yellow bile, and black bile. The temperaments of the persons to be treated are expressed by the Galenic concept of their being sanguine, phlegmatic, choleric, and melancholic, according to the preponderance of the humours in them. Humours themselves have been assigned temperaments, as we have had the occasion to describe earlier. Drugs are also assigned temperaments and there are degrees of these temperaments. These are known as the "Galenic grades".

In Arab medicine, the body is regarded as comprising the following:

i) *Arkan* (elements) comprising the different states of matter and the materials entering into and forming a part of everything in the universe.
ii) *Mizaj* or the bodily temperament (see Appendix A).
iii) *Akhlat* or the structural components.
iv) *A'da'* or the fully grown organs.
v) *Ruli* or the vital force or life-force.
vi) *Quwa',* the bodily power.
vii) *Afal,* the corporeal functions.

It will be seen that these seven working principles are comprehensive in that the *arkan* include the elementary constituents of the body; the *mizaj,* the physico-chemical aspects of the body; the *akhlat,* the bodily humours; *a'da',* the anatomy of the body; *ruh,* life, life-force, or vital force; *quwa',* energy, and *afal,* the physiology of the body which could include the biochemical processes going on within the body.

Ibn Sina writes:

> "If a physician, like Galen, were to undertake a logical explanation of the first group of matters (i.e., elements, temperaments, humours, faculties, vital forces, and the general law that a state cannot exist or alter without a cause and the number of such causes) by logic and reason, he would do so not as a physician but as a philosopher who would thus be like a jurist trying to justify the correctness of the majority opinion. This, of course, he might do not as a jurist but as a man of knowledge. However, it is not possible either for a practitioner as such or a jurist in his own capacity to prove such matters by logic and reason, and, if he does so, it will be at his own peril[17].

It has become necessary, in the light of modern progress in fundamental particles and quantum and wave mechanics to examine

temperament afresh. Thus from Ibn Sina's reflections on heat, cold, moisture, and dryness, we are led to the conclusion that "heat and cold are but two opposite directions of the energy in space, while dryness and moisture are two contrary reactions of the mass in time." Einstein has shown that in the phenomenal world there is neither pure energy nor pure mass in any form except as a relative proportion of both in their varied manifestations. It has been argued:

> Everything as being made of mass and energy at the same time, they were separate from each other in thought. Science also recognizes that no form could have quality to the absolute degree: the generalization of the Unani system that all objects including what we may term as the atoms, molecules, elements, compounds, genes, or chromosomes, have their own relative proportion of all the four qualities – two of mass and two of energy.

That this view is reasonable could be seen in the example of heat which, even, if of thousands of degrees, is only relative to the temperature of water at its freezing point. The degree to which it could be further increased until the arbitrary limit of absolute is reached would be the degree of cold in its composition.

Similar is the case in regard to dryness and moisture. Thus the simultaneous presence of qualities of both mass and energy, and thus of space and time, inseparable as they are, into pure space or pure time cannot be satisfactorily accounted by either the spatial elements or chemistry or by the precisely measurable movements of time. In order to describe and explain a constitution of this kind, the Unani system adopts fire, air, water and earth as its symbolic elements which possess energy to the absolute maximum and minimum of the elementary qualities of both space and time. Thus according to Avicenna:

> "In things that grow, as also in the elements, these qualities exist in space-time. In the organization of elements there is either absolute excess or deficiency of" these qualities. Therefore, heat is present in Fire and Air, cold in Earth and Water, dryness in Fire and Earth, and moisture in Water and Air. Thus the elements come to differ as also resemble one another ..." (Arjuzah, 13-26)[18].

> As for symbols, Eddington has said:

> "That environment of space and time and matter, of light and colour and concrete things, which seem so vividly real to us, if probed deeply by every device of physical science at the bottom, we reach symbols[19].

And Max Planck, the Father of the Quantum Theory, says:

> "Indeed, if we want to grasp reality, the world beyond the world of sciences, it can only be perceived indirectly through the medium of the world of senses and by means of certain symbols which our senses allow us to apprehend."

And further:

> "... the study of physics which a generation ago was one of the oldest and most mature of natural sciences has today entered upon a period of storm and stress which promises to be the most interesting of all. There can be little doubt that in passing through this period we shall be led not only to the discovery of new natural phenomena but also to new insights into the secrets of the theory of knowledge. It may be that in the latter many surprises await us, and that certain views, eclipsed at the moment, may revive and acquire a new significance. For this reason careful study of the views and ideas of our great philosophers might prove extremely valuable in this direction[20]."

The present-day science measures the chemical and thermodynamic nature of substances through physico-chemical methods or spectral analysis. In *Tibb,* on the other hand, energy is measured according to whether it is cold, hot, dry or moist. It is through sensation *and* action only that the presence of a thing is established.

In the *Canon,* Ibn Sina offers the following definition for Elements:

> "Elements are simple substances which provide the primary components of the human body. They cannot be subdivided into newer components. It is from their combination that in nature all order of things are formed."
>
> "It is necessary for the physician to accept from Natural Philosophy that the Elements are neither less nor more than four in number and of these Fire and Air are light, and Water and Earth heavy" (*Canon,* Part I, para 20-21).

It should not be construed that a literary meaning has been injected into the so-called Elements. This would not be true, for Ibn Sina later says:

> "By Air we do not mean the Air as an Element but the atmospheric air which surrounds us. This air is not the Elemental Air, even if that be supposed to have any existence" (*Canon,* Part II, para 222).

Colonel M.H. Shah argues that this confusion arises from the fact that the word, "substance" is employed by Ibn Sina in two different senses. "In its more common usage", he says, "it no doubt means an object or a thing like a man, horse, fire, air, etc. In the primary sense it is, however, a mere abstraction employed to convey the idea of individuality such as enables different organizations to retain their 'essence' while undergoing a series of quantitative and qualitative determinations, e.g., in one being successively young and old, and in water from first being liquid, getting converted into vapour or steam. It is in this sense that the Elements, which are changeable but yet retain their own individuality in space-time, have been regarded as being substances ...".

The real fact is that the Elements are mere abstractions, which generalize the various qualities by which all objects and phenomena are recognised in this world. In this connection we have to remember that perception is made through the five senses of touch, taste, smell, hearing and vision. The Unani system regards all these as being differentia of the touch and as such what could be generalized in the terms of heat, cold, dryness, and moisture which are fundamental qualities of touch – 'the mother of all sensations.'

Aristotle (*Meteorologia*) defines two of the qualities hot and cold, as active and the other two, the dry and the moist, as passive. Hot and cold we describe active, for congregating is essentially a species of being active; moist and dry as passive, for it is in virtue of its being acted upon in a certain way that a thing is said to be 'easy to determine' or 'difficult to determine.' And thus, while science goes on to differentiate the mass into chemical elements and the energy into photons and measurable wavelength, the Unani system differentiates heat and cold in the energy and dryness and moisture in mass as stated below:

> "Of the four qualities heat produces warmth, disperses, resolves, melts, destroys and evaporates; cold makes the things cool, aggregates, freezes, and extinguishes the heat; moisture makes the objects soft, humid, greasy, thin, and fluid; dryness makes objects dense, hard, stable, and resistant."

We shall now see for ourselves how the Greco-Arab system has coped with the physical laws of chemistry.

i) *Laws of Conservation of Matter and Energy*

Elements are the ultimate units of matter and energy and are incapable of disintegrative alteration. Change from one compound to the other is merely a less or more of their quantity and quality.

ii) ***Law of Constant Proportion***

This can be explained in the Greco-Arab system on the basis of the quantitative proportion of elements. In isomerism, where this law is not true, the Greco-Arab system accounts for it through changes in the form or position of the Elements, "which is the same thing as the recognition of varying forms of architecture amongst the combining elements by modern chemistry."

iii) ***Charles' Law***

It states that at even pressure gases expand at 1/273 part of their volume at 0-10°C The Greco-Arab system has generalized this law by stating that heat leads to expansion.

iv) ***Boyle's Law***

It holds that, at constant temperature, the volume of the gases varies inversely as the pressure to which it is subjected. In the Greco-Arab system, the action of cold is analogous to that of pressure, with its force opposite to that of heat.

v) ***Dalton's Law of Partial Pressures***

It states that the partial pressure of two gases in a mixture is a total of the partial pressures of both. This can be accounted by the Tibb through the generalization that different gases have their own proportion of heat or outward force which gets summated in the mixture thereof.

vi) ***The Law of Osmotic Pressure***

It says that at constant temperature the osmotic pressure increases with the concentration of the substance in solution. This in the Tibb can be generalized by the statement that the greater the concentration, the greater would be the mass and hence the greater the degree of attraction.

vii) ***The Law of Diffusion***

According to this law, the velocity of the diffusion of any two gases is inversely proportional to the square-root of their densities. This has its counterpart in Tibb in that the denser the object, the greater its Earth, and, because of this, its stability and resistance, and lesser would be its dispersion.

viii) ***The Law of Dulong and Petit***

It states that the specific heat or the heat required to raise the temperature of one gram of substance by 1° as expressed in calories is lower in the metals with greater atomic weights, has been generalized in Tibb by the statement that the heavier an object, the closer is the contact of the reactive elements and hence the greater is their conductivity.

The method of determining the molecular weights of different substances by the elevation of their boiling points or depression of the freezing points of their solutions have their counterparts in Tibb in that the greater the Earth in solution, the greater is resistance to change from the liquid to gaseous or to solid state' and hence the greater is its weight. By the same token, the melting point of ice is lowered by increasing the pressure as the increased density would increase its Earth and thus its resistance.

The Kinetic Theory of Gases postulates that the molecules of gases are in a state of continual motion and has its counterpart in Tibb which says that the air, being hot, is active.

These generalizations can be applied to energetics and electro-chemistry. It, however, reflects the more precise nature of modern science that it should have come out with laws to break up these generalizations. The same thing has happened in the case of drugs where chemical research has broken up the composite drugs and isolated their active principles.

Vital force (*ruh*) provides Tibb with a measure for differentiating the various faculties (*quwa'*) or the biological systems and their functions (*aral*). The word "vital force" has surfaced again as *entelechy* by Driesh and *elan vital* by Bergson.

Ibn Sina clearly states that "the Vital Force in our language is not the 'soul' of the philosophers" (*Canon,* Part II, para 101). He holds it to be of material nature:

> "... vital force is created from the lighter and vapoury portions of the humours, and just as Liver is concerned with the production of the former, Heart is the centre of production for the latter." *(Canon,* Part I, para 251).

Colonel Shah, analysing the concept of vital energy, states[21];

> "... vital force is identifiable with the basal metabolic energy which lies behind the life and activity of all organs and tissues and with which the cells of all animals by using oxygen, pure air, and

> eliminating CO_2 and water (the hot vapoury waste products) maintain the body temperature, heart beats, and respiratory movements."

The word, "vital force," therefore, includes both the metabolic activity of the body – which includes the different metabolic cycles and much else besides – and bears the same relation that the earlier generalizations of the basic physical laws by Tibb bore towards modern concepts. But possibly the concept of "vital force" goes further, as it is not reducible to physical laws, and includes possibly many things – things like conditioned reflex, behaviour pattern, personality make up, and so on. So that it is not really reducible to a metabolic concept even.

Ibn Sina observes that on the quantitative side the substance of "vital force", with respect to various mechanisms in the processes of the body, is regulated by the vasometer centre through the contraction and expansion of the pulse. In the *Canon,* Ibn Sina says:

> "Physicians also believe that just as the vital faculty is a necessary prerequisite for the life of the organs, it is also responsible for the movement of the light, ethereal, vital force. It carries the Force towards the bodily organs and also contracts and expands it and purifies it by supplying the light air (oxygen). Hence from the point of view of life, it enables the differentiation of vital force into the various faculties and considered from the point of view of pulse (circulation) and respiration, it is directly responsible for their activity" (*Canon,* Part I, para 260).

Ibn Sina mentions a number of other mechanisms in regard to the regulation of *vital force.* Thus, on the chemical side, Ibn Sina mentions the role of oxygen. What, however, has become apparent to the modern student of medicine is that what Ibn Sina describes is not only the complex degree of variations undergone by the supply of oxygen but also the wide multiplicity of enzymatic and hormonal changes in the substrate. This should be implied by the following passage:

> "Human body originally develops from a union of the seminal fluid of the male and the germinal fluid and menstrual blood of the female. The seminal fluid of the male is generally considered as the efficient cause, while the germinal fluid of the female and menstrual blood provide the material cause. Both resemble in being moist and liquid, although the earthy matter and the watery content are greater in the blood and in the seminal fluid of the female, and air and fire (heat) are greater in the semen of the male. The original product

is moist, but it also contains earthy matter and the element of heat. And as the earthy matter produces hardness and the heat maturation, the finished product of the two fluids naturally becomes thicker and harder due to the interaction of these two elements. The resulting hardness, however, is not like that of a stone or glass which do not dissolve and disperse to any appreciable extent and are able to withstand prolonged wear and tear. On the contrary, our body is (so moist) that exposure to factors acting from without as well as from within prove calamitous. Externally, for example, the atmospheric air causes both dissipation of moisture as well as putrefaction. Internally the innate heat (basal metabolic heat) of the body has a constant dispersing effect and the abnormal heat (from the digestion of food) tends to cause putrefaction of the bodily secretions. All these co-operate in the ultimate production of dryness. The daily decrease in the intensity of the innate heat (basal metabolic activity) occurs from the increasing dryness of the bodily organs and on account of decrease in the innate moistures which are like the oil for the lamp of (metabolic) secretions to withstand the dispersing effect of heats of all types, i.e., heat which is (metabolically) produced in the system and the heat produced by physical (and mental) activity. The innate secretions do not possess any such resistance. If they persist for so long, it is because their dispersion is being constantly counteracted by the supply of food. This action of food is, however, *not* everlasting but merely for a limited period" (*Canon,* Part III, para 7-30).

Metabolism briefly expressed, is the sum total of anabolism (build-up) and catabolism (destruction). The ontogenetic development of the individual and his personal reactions due to the various internal and external influences could be best explained as the result of dryness – destruction – which is constantly made good by the production of moisture – reconstruction.

Vital system – the system which is concerned in the production and utilization of vital energy – may, therefore, be regarded as comprising the following:

1. Life and metabolism.
2. Respiratory system which through the supply of oxygen and by the elimination of carbon dioxide and water, conditions *vital energy.*
3. Circulatory system with its afferent veins and afferent arteries, capillaries and tissue spaces that carry the *vital energy.*
4. Vasomotor system which regulates the quantitative discharge of the mass in *vital energy.*

5. Autonomic nervous system which controls the qualitative discharge of the *vital energy.*
6. "Purpose" as expressed in the form of emotions.

This would show the "heart" of Ibn Sina to be different from the heart of the anatomists. It is centred in the diencephalon and yet pervades the whole body. The centre of this heart encompasses part of the brain but not of the brain of cognition and movement. It is that portion of the brain which in the phylogenetic development of man is the one that develops earlier and the one that regulates all organs and organ systems. The pituitary gland which presides over the function of this hypothalamic region may, thus considered, also be called a part of the heart in the Greco-Arabic system.

Colonel Shah points out to the remarkable resemblance between the cold and moist and hot and dry imbalances on the one hand and the states of vagotonia and sympathicotonia on the other. He says:

> Indeed this resemblance appears to be so close in the following table by Reimann that the movements of Vital Energy may be interpreted as being alternative type, of discharge through the vegetative pathways:

Vagotonia	**Sympathicotonia**
Wet type with increased oral, nasal, bronchial, and other secretions	Dry type with decreased secretions
Low temperature	High temperature
Low basal metabolism	High basal metabolism
Low blood pressure	High blood pressure
Slow pulse	High pulse rate
Increased peristalsis	Decreased peristalsis
Vasodilation	Vasoconstriction
Contracted pupil	Dilated pupil

Temperament, an aspect that we now propose to discuss, in the Greco-Arab system, recognizes the uniqueness of the individual. We find that in our daily experience, some individuals have a greater built-in *vis medicatrix naturae* which is the *tabi'at mudabbirah badan* or the resistance put up by the body. One person may accept a drug, the other may show side reactions. Similarly in diseases due to bacteria and viruses also the same differentiation between individuals may obtain and hence Tibb takes count of the individual's reaction to medication.

Temperament may be defined as that pattern of qualities as a whole that emerges from the action and reaction of the mass and energy and thus in the human body of the structure and functions. This is, indeed, the outstanding contribution of Tibb to medicine, and although it must be conceded that since the days of Abu-l-Qasim Zahrawi, Ibn Sina, and Ibn al-Baitar, Tibb has stagnated it is not poor in theories regarding the philosophy of medicine. It is assumed that, as the basic qualities of the energy are heat and cold and of the mass dryness and moisture, their interaction leads to the emergence of a new balance of qualities which varies with the quantitative proportion of the primary qualities. If this proportion were to be equal in the composition of an object, the temperament or pattern of its qualities will, then, be absolutely balanced. An absolute balance of this kind would be impossible to achieve as the opposing qualities of heat and cold, dryness and moisture would so neutralize each other that a compound of this nature would be entirely changeless.

Ibn Sina arrives at the following patterns of temperament for man:

1. A general balance or pattern of the species as a whole.
2. Specific pattern of the most balanced individual of that species.
3. General pattern of the geographical location.
4. Specific pattern of the most balanced individual of that race.
5. The general pattern of an individual as against other individuals of the race.
6. The temporary balance (or equilibrium) of an individual which is the most suitable for his or her personal condition (e.g., age, season etc.).
7. The general pattern of an organ as opposed to that of other organs.
8. The balance or equilibrium of an organ which is the most suitable for its own momentary state (rest or activity) (*Canon,* Part I, para 34).

Thus there are factors going to make a temperament that are innate as well as environmental. About innate factors Ibn Sina says:

> "Individuals vary according to the strength of their innate heat (metabolism) and their secretions. They have their own fixed measures of life during which their bodies withstand the necessary wear and tear consequent upon normal life. This measure is fixed according to original constitution, the strength of metabolism and according to the unalterable quantity of the secretions. On the other

> hand, they may die earlier of causes which dry up and disperse the innate fluids or act in some other manner" (*Canon,* Part III, para 35-37).

It will therefore be seen that *vital force,* a major aspect of temperament, is neither the "soul" of the philosophers nor the "breath" of Galen, but a simple generalization with respect to the mechanism of life. It is a Divine Gift that bestrides all life and is attuned to the specific temperament of an individual. Temperament is the equivalent of the psychoneuroendocrinal system with its orientation tempered differently in each individual.

Humoral pathology which regarded health and disease in terms of equilibrium or balance and imbalance of the different components of the body was furthered by Galen in *Methodus Modendi,* was but scantily mentioned by Hippocrates and the followers of Hippocratic school although four humours and temperament constitute the basic edifice of the Greek and the succeeding Greco-Arab System.

The late O.C. Gruner selected the *Canon* amongst the Arabic works because of Ibn Sina's subscription to the theory of temperament. Gustave Leblanc has said (*The Arab Civilisation,* p. 452) that the Arab system of medicine went to great lengths on the application of prophylactics and deontology. The Arabs applied the principle of treating patients according to their individual temperaments, and the loss of life was proportionately less than it is at present so far as treatment by physicians is concerned. Arthur Guirdham in this context, writes[22].

> "After the lapse of centuries, and following several ephemeral flirtations with other hypotheses of disease, we are returning to a conception of morbidity based on, and in its varying manifestations coloured by, the innate and vulnerable nature of the individual."

We therefore see that temperament is an integrative system which keeps all the organs and their functions linked with: the other. The body therefore functions like a machine whose cogs and wheels are kept well oiled.

The body is to be regarded as a whole and a unitary organism. All the organs, glands, cells and the components of the nervous system are dependent upon each other. Let one come to a standstill and the whole organization of the body will collapse. None of them admits of independent existence or unit. Organs, when intact, alone ensure life, and all the living beings constitute one unit. This unitary nature has had to be subdivided for certain specialized and phylogenetic considerations, but such considerations are of a secondary and arbitrary nature, since it

enables us to understand the whole by taking recourse to different aspects. Whether we study a plant or an animal, we study it as a whole being.

During the 19th century it was this partial or separatist tendency which prevailed. A body was, on this approach, regarded not as a unitary biological unit but as a colony of cells. These ideas were especially to the fore with work on evolution and study of the lower invertebrate animals like many coelenterates where the cell colonies are autonomous. A.P. Cawadias, for instance, says in this context:

> "Recent work has demonstrated the inadequacy of separatist principles, and has thus prepared the ground for Neo-Hippocratic medical doctrine[23]. In an address to the British Association in 1879, George Mivart said: 'As the living creature is a highly complex unity, both a unity of body and also a unity of force, a synthesis of]activity ... we need a physiology specially directed to the physiology of the living body considered as one whole'."

The theory of temperament subscribes to the view that a bodily organism is a single unit. It was in the old days held that a physician who called himself one but was unfamiliar with the philosophy of medicine was an ignoramus, and for the succeeding twenty centuries after Hippocrates the theory of temperament prevailed. Gradually new thinking began to take place of the old and reached its zenith with the advent of men like Huxley and Haeckel, with everything considered to be reducible to mechanistic concepts. Indeed) T.R. Huxley's radicalism is well known. Such a thinking reached its acme during the late 19th century. This approach was initiated by Francis Bacon 300 years ago.

Many theories have surfaced and sunk. We, today, see the re-surfacing of the Pantheistic doctrine transmogrified into Existentialism, with the all-pervasive Mind of God being, as it were, transferred to the realm of human experience. Then the Pantheistic doctrine itself regarded the universe as a part of the universal soul. The esoteric approach to life and environment was all philosophy with little leeway for anything else. The empirical approach which blossomed forth during the Renaissance broke away quite a bit from the past, but, while professing empiricism, it was suffused with philosophy through and through. It refused to subscribe to a view that could not be tested by the tools and measures of the intellect, and the unseen and the unknowable it denied altogether.

Galileo was a great exponent of the empirical school. His motto was that he would teach an altogether new science and that what hitherto was immeasurable he would measure. The science that resulted from

these excursuses into the phenomenal world was called the natural science. It reached its apex during Newton's time and Kant's *Critique of Pure Reason* is its philosophical exposition in the sense that he holds that metaphysics or "beyond physics" is unknowable and impossible. Since he held that the ultimate reality is knowable by the dimensions provided by the straight lines, the more the mathematics the greater will be the science in it. The mechanistic concept was fanned by Darwin's theory of evolution and natural selection in that everything was put in according to a set pattern. Newton's law of gravitation is another index of the same view, although no one can deny its epoch-making significances. The result of this so-called Cartesian mode of thinking that reason, verifications, measurements, etc., and not emotive feeling or even quasi-mechanical considerations were allowed much sway. Colour, for instance, was regarded as a physical entity in terms of its relationship with light or constitution of chemical substances. This approach to reduce everything to mathematical proportions reduced everything to mathematics and even the norms of physics were applied to biological organisms. No one can say that such a philosophy has no uses of its own; it has added so much to our knowledge that we would relapse into savagery without the tools which this mechanistic concept has presented to us. The point to note is rather that the excess of all things is bad, and the mechanistic concept is no exception to it. A.P. Cawadias gives Chiracism as an instance of the excessively carried mechanistic concept[24]:

> "The chiracistic principle, so called from Chirac, the French eighteenth century physician and one of its leading exponents, consists in excessive intervention. Chiracism is in absolute opposition to Hippocratism, and is based on the mechanistic conception of disease. According to the chiracists, who include the Rasorians, the Broussaists, the Brownians, disease results from the mechanical action of external factors or stimuli. There is no special curative reaction of the body. To cure disease, we must, therefore, mechanically apply stimuli contrary to those that have provoked the disease. The chiracists are characterized by their contempt for the ancients, meaning Hippocrates. This principle resulted in immoderate bleedings, excessive administration of antimony, and other violent drugs. It is to be noted that the Greek mechanists, Asclepiades, Themison of Laodicaea, Thessales of Tralles, although in theory akin to the chiracists, possessed the Greek sense of measure and, therefore, did not allow their theories to lead them to violent and blind interventions. In their practice they were Hippocratists. Even Themison and his pupils, who developed metasyncrisis or shock-treatments, were animated by a biological and clinical spirit.

> Recent clinical work has shown that of these three principles the constitutional or biological principle has a greater pragmatic value. And to this principle is due the great progress in therapeutics and development of the constitutional methods of treatment."

We, the exponents of Tibb, believe that it is never possible to determine the overall effect of a drug. To take a very recent instance, prostaglandins can cure cold, and yet induce abortion. The woeful saga of the thalidomide babies is before us to show how even earlier clinical studies cannot irradiate all the dark corners of unpredictability. Nor is it possible to say that this much dosage of a drug would be effective. This can only be ascertained by taking into account the temperament of the individual, and not on the basis of a general dosage. The effect of a drug is compounded of many variables: hormonal response, neuromotor system, overall bodily resistance, etc.

The particular concept of matter has, no doubt, enhanced our knowledge of the material world, and radiation physics is a very potent tool in therapy, particularly of turn ours and sarcomas. But with all its *psi* and *omega* particles, tachyons and what not, it does not explain movement or the circulation of blood. It only points to the conditions. The position, therefore, of an animal body is just that it cannot move of its own accord nor comprehend nor see on its own. The organs of life are made of organic and inorganic ingredients, and death is the end of the movement and the degeneration of the organic matter. The body then putrefies and it begins to decompose.

Man, as we all know, though an animal, is a creature *sui generis* unto himself. He is impossible to explain from a purely mechanical point of view. We have to take cognizance of the individuality of a plant or animal, and have to go beyond into the realm of *pneuma, anima,* or soul. Stace, in *Space, Time, and Eternity,* has examined the problem of the soul with regard to living beings, and it is his view, as it is ours, that neither animals nor plants nor the mineral or inorganic kingdom is devoid of the soul in one form or the other. The soul of man' is, however, distinguished by its possession of a unique soul that is characterized by consciousness and which has elevated man even above the angels. Modern science does not regard the soul as something related to health.

Even insofar as light is concerned, man has not been able to escape, despite his deep probings into the structure and velocity of light, and duality posited by matter. Is light to be explained as being corpuscular, wave front, composed of quanta waves, or is it electromagnetic? It is all of these and this fact alone has dealt a great blow to the mechanistic concept. It has, therefore, got to be acknowledged that the Ultimate

Reality of which the duality of matter is also a manifestation is something to be accepted, for by merely cavilling at parts and by analysing parts, we can never achieve a total synthesis.

Before the invention of the microscope – or, perhaps, more important, before the manufacture of chemicals from coal in Germany and England – natural plants, animals, and animal drugs were the staple of medicine in Europe. Its principles were largely of Greco-Arab provenance. The Arabs had not only learned from the Greeks but also from the Egyptians, Iranians, and Hindus. The whole of Europe, after the Crusades, was aflame with anti-Arab sentiments. Shortly afterwards, first Chengiz Khan and later his grandson, Hulagu Khan, laid the Muslim world in ruins, with the repositories of knowledge and libraries thrown into the rivers and put to fire. The Muslim culture, despite the fact that it was showing signs of decline, was still the most advanced of its time. By the time Europe was basking in the sunshine of the Renaissance, the Muslims of Spain were being driven from Granada to seek refuge in North Africa. Sicily had been lost much earlier. A.N. Whitehead's assertion that in the Middle Ages, Europe knew less about science than it did during Archimedes' time is basically true, despite men like St. Thomas Aquinas and Paracelsus. It is through the Muslims that the *Poetics* of Aristotle was rediscovered; it is through them that the original manuscripts of the major works of the Greeks and the Romans were found.

The mental awakening being generated by Islam was proving to be a thorn in the eyes of the Western critics. And we must not forget that most of the states in Europe were being run by the judgements of those critics. Such a behind-the-scene rule demands that speculation, freedom of thought and speech, and mental horizons should be kept under check, and the story of the Medieval Europe is the story of a recurrent battle between the freedom of thought and the dominance by the critics, who clung to their views. So most of the people did not like to follow any religion in their worldly affairs and, therefore, new trends emerged which ultimately led to the secularization of virtually the whole of Europe, with the exceptions of Spain, Portugal, and Ireland. This tendency towards secularization is evident throughout the length and breadth of the West. Even though basically Christian, it has been flooded by secular tendencies, and this state of affairs reached its maximum peak during the nineteenth century.

This tendency released the flood gates of speculation and freedom of thought. The underlying tendency is that of freedom and it was partly as a reaction to this freedom that Prussian militarism and dialectical materialism had their birth. But both these reactions were also governed by the mechanistic concept in which the soul or the individuality of a being had no place. Any school of thought that is free from metaphysics

and is divorced from the mystic will always be partial, warped, and like a faded bud that is denied its nourishment. The body represents matter, and the soul energy. The energy of matter and that of the soul are antipodal. If one is positive, the other is not. An atom is compounded of negative (electrons) and positive (positrons) components: this is true more or less of the human body; it is also composed of the positive and negative constituents. Life is the reflection of this mutual co-operation between the soul and the body. One component is earthly; the other is celestial: one remains bound to the earth; the other soars to its Creator. The Urdu poet, Ghalib has said:

> "Beauty without form and manifestation cannot dazzle our gaze. The greenery of the garden bespeaks the effect of Zephyr."

A vast majority of the historians of the West are agreed that the Renaissance in Europe was partly possible through the transmission of Greek and Roman corpus of learning to it through the Arabs. St. Thomas Aquinas' Aristotelianism was probably inherited from Ibn Rushd (Averroes) and the Europeans of the latter-day medieval period were inducted into art and science again. But the general tendency of the people and their attitude towards Islam placed them in the morass of materialism, from which they have not been able to extricate themselves even to this day.

It was this divorce from the spiritual heritage of man that led to the birth of dialectic materialism which regards matter as the basis of everything. And so the West has come to realize that its divorce from the spiritual has not redounded to its advantage. Materialism ensures prosperity. But spiritualism demands that the bodily desires be kept under control, and in dialectical materialism, spiritualism is, of course, an impediment in the progress and onward march of the material forces. The bodily, the sensual, inclines towards the low and the spiritual soars towards the high. But for life the bodily and the spiritual, both are essential, and a proper balance between the two – never an easy operation – has to be maintained. Never an easy operation, because the bodily and the spiritual are the antitheses of each other. As one advances in one direction, he leaves the other pole further away. Conscience (*nafs*) is something that is intermediate between the body and the soul, but its inclination is towards the body, and it is this inclination that is at the root of the conflict. It is possible through effort to change the nature of this inclination. The pleasures of the body and relish of the sensation, have led to the imbalance between the soul and the body. The nature of conscience is that the more it gets, the greedier it becomes, and the more are its demands. Any obstruction in its way it would like to remove without

compunction with all its might. It is this excess-loving nature of conscience that leads it to draw swords against religious codes curtailing its freedom and in its denial of the Godhead.

In order, therefore, to see things in their proper perspective, it is essential to subscribe to the doctrine of Unity, the Oneness and Omnipotence of the Godhead. Man cannot devote himself to anything without dedicating himself to belief in One God and to ponder over the glory that is the Cosmos. It is only belief in One God that would keep man away from dishonesty of purpose and mental sophistry.

The Renaissance in Europe was, one should not doubt it, for the major part due to the innate genius of the European themselves to realize their potentialities to the full in which the Arabs played the role of a catalyst. Be that as it may, Renaissance resulted in the material progress of Europe to an unprecedented degree with untold repositories of knowledge laid out before all and sundry. Raphael, Titian, Cellini, Michelangelo, Leonardo da Vinci, Shakespeare, Calderon, Cervantes, Montaigne, Francis Bacon, Tasso, Galileo – these are names sufficient to overawe any other age and next to the Golden Age of Greece, the world has yet to produce so many giants within such a short span. It was the age of wonder with the world being viewed through a different kind of dioptre. But this sense of romanticism, of wonder, drew the Europe of the age away from the centre, as William Butler Yeats had to wail some 350 years later:

> Turning and turning in the widening gyre
> The falcon cannot hear the falconer ...
> Surely the Second Coming is at hand.

The Europe of that age nor of the succeeding ages has not even as a matter of grace acknowledged the debt of the Arabs in introducing Greek to her long-lost offspring. I have recently gone through a series on *Man* published in England, surveying briefly industry and measurement. If one reads them, then even in between the lines there is not even a fleeting mention of the Arabs. One cannot say that the Orientalists have succeeded in convincing their fellow-Europeans about the contribution of the Muslims to world civilization. One need not catalogue the contributions of the Muslims, for they spanned, as do all dynamic civilizations, every nook and corner of knowledge. One should not forget that never in mankind's history, not even during the times of Alexander and Julius Caesar, has any country reigned supreme throughout the world, as Arabia did during the time of Caliph Umar down to the Umayyads. If this is not history, what else is it? The insignificant Byzantium, with its rulers hurrying and scurrying throughout the length and breadth of Europe, constitutes

history but not the Arabs who brought to the world something more than "Hear, O Israel! the Lord, Lord God, is One." According to the Holy Qur'an, the Muslims say:

"Thee (alone) we worship; Thee (alone) we ask for help."

Such a distilled concept of monotheism has never been granted to the world as it was to Muhammad (ﷺ), the last of the prophets.

The characteristic feature of the Renaissance was the Greek concept of proportion overlaid by the religious and the self, despite the rhapsodies of Spengler on the so-called Faustian art. The self-gained dominance everywhere, and knowledge was to serve as a vehicle of the body.

Knowledge became transformed into a serpent and attacked man with its bared fangs. Knowledge, instead of being his staff for support, became changed into a viper and instead of conferring benefits upon him, led him into all kinds of blind alleys. The wrong and misdirected use of science altered his very temperament and it has not been able to regain its balance. The bald person, as the Urdu saying goes, obtained possession of claws to scratch his head with, and not only the bodily but also the ethical code was laid desolate. The place of esteem, self-respect and virtue has been occupied by pride. These values were, of course, in the way of the desire for the growth of the self's desires, and had apparently no benefit to confer. And, what is more, they were thought to be beyond the pale of scientific spirit!

The result of all this was that this division in the content of the *mens* and the absence of spiritual dedication turned the proper value due to knowledge all upside down and these have their own reflections in the methods and approaches adopted in respect of knowledge. Materialism, in short, invaded all the niches of the Western culture.

We cannot deny that the physical aspect of man as reflected in his sensuous experience is absolutely essential for his bodily overall organization. It is impossible to live without it, but it should not be allowed to go unleashed. Knowledge without an intact and wholesome *mens* or intention becomes fatally deleterious and an object of shame. When the cultivation of the self is hitched to the locomotive of untrammelled freedom, its speed is not possible to govern or regulate. Love for pleasure of the ego and self-glorification add to its acceleration. When the physicist of the twentieth century examined the structure of the atom, he found that the phenomenon of cause and effect fully operative in the world of the sub-atomic particles but not so on the higher level, he was perforce led to think that, behind all these operations, there is a power that has given birth to this concatenation of cause and effect and the different states of matter. Although Tibb is not a spiritual discipline or knowledge, and,

although its scope does not transcend beyond what is practical and of day-to-day recurrence, nevertheless, in order to comprehend the mind, universe, and the phenomenal world correctly and in a true perspective so that harmony may be affected in thinking, it does believe that the soul exists and belief in one God at Whose Behest and Command everything works and functions, is essential.

We have already pointed out that the form cannot be understood without the soul: it is the combination of these, in conjunction with the self, that constitutes temperament. Tibb, therefore, cannot regard the soul as an extraneous entity: that has no bearing on temperament or the personality of the person to be treated.

And coming to the question of *numena* (things-in-themselves) and the transcendental being like the soul, what harm, it might be asked, would accrue if we ascribe to transcendence, the characteristics of the soul and the Attributes of the Mind of God. But how can the subscribers to materialism – of which dialectical materialism or matter in constant opposition with the spirit, the converse of the religious belief, in which the spirit has to overcome the world of the senses – deny their own egohood and the primacy of matter by inclining to the view that ego and matter would be subservient to a greater power? Moreover, if the primacy of the spirit is accepted, how could the arbitrary values generated by the ego be kept under check? In fact, under positivism and naturalism, all kinds of excesses were allowed. And we must not forget that Nazism and dialectical materialism are the offshoots of the same Hegelian approach to philosophy.

About Communism it has been said, that, although it denies the existence of God or is agnostic, and that, although it has evolved a new code of morality and law, the Bolshevik countries are doing well. It is to be submitted that Marx's original attack on capitalism and religion as the "opium of the people" arose as a reaction both against the *laissez faire* economy and the divergence between the claims put forward by the claimants of equality and exponents of Christianity.

In fact, one has to study, apart from Lenin and Stalin, the Western writers like Christopher Caudwell, the author of *Illusion and Reality* and *Studies in* a *Dying Culture* and the early works of Arthur Koestler and others to see how this revolt was asserting itself in different forms. Leo Tolstoy, a profound Christian that he was, reflected this tendency all too well in his preference for *Uncle Tom's Cabin* to Shakespeare and in calling poetry "rhyming soldiers arrayed against each other." This attitude found its culmination in Trotsky's saying that for the good of the people the individual, if needs be, should be crushed out of existence. But such a system, if it guarantees stability, does so not only at a certain risk but also hides powerful dams of revolt which can burst at any time,

overcoming all the *superstructures.* Such a system lasts as long as the tools of oppression are in the hands of the ruler. It cannot guarantee built-in serenity and peace of mind. And, if a country or a nation falls from the level of humaneness, so much so, that its people should tend to regard the satisfaction of the animal instincts as the end-all and be-all of existence, and only thus can they be prevented from maleficent acts, can we really regard this state of affairs as enviable?

The point at issue, therefore is that the objective of life and the point of view adopted, are aspects that dominate man's existence, his acts, and his thoughts. The exponents of the present-day medicine are deprived of this unitary concept and a vast majority of them does not accord the importance due to the moral code. For this reason their system does not formulate a harmonious and a uniform *weltanschauung,* nor does it emphasize the prophylactic aspect of ethics. The latter aspect has been in general, transferred to the health and hygiene departments of the government, and its whole attention is diverted towards the curative aspect. It does not dam the tendencies that lead to the deterioration of health or on the excessive play of desires or immoral doings. Such a system would run for the excavators and bulldozers when the flood has already occurred, and to press into service the fire brigade after the fire has started. It does not, in general, aim at the development of the prophylactic aspect, for what is required is not the dosage of medicine but to control the desire. The absence of belief in the Hereafter leads often to a short-sightedness and astigmatic approach.

It is well known that the parentage of the present-day allopathic medicine is derived from the Greco-Arab system. From the time of the Renaissance, however, the West began to follow a different course and very soon parted company from its parent, and began to move rapidly in a different, indeed, opposite, direction, for, whereas Tibb follows a synthetic course, allopathic medicine has followed an analytical approach. Treatment with laser beams might cure a tumour but would only do that much. What remains possibly as a common denominator between the two is treatment by contraries (*ilaj bi al-did*) and in some cases treatment by similitudes (*ilaj bi al-mithl*) is also operative.

Insofar as the analysis or the dissection of the organs and their physiology is concerned, there is no difference between allopathic medicine and Tibb, nor do they reflect any viewpoint. They are both related insofar as the classification of diseases is concerned.

Medicine East and West: Differences and Similarities

The basis of modern medicine is the Hippocratean or Greek system which the Arabs furthered and developed so much so that it became an

international system of medicine. Additions, subtractions, and reforms were introduced thereinto, and in the West it came to be known as the Arab system. The Greco-Arab system continued to be practised in Europe till the 18th century and was taught in medical colleges all over that continent. What is known as the remedy based on home medicine or natural herbs is a relique of the system which prevailed for over twenty centuries all over Europe. The West has, however, changed it having imparted to it its own mould. The theories of humour and temperament have been altered and their places have been occupied by material and mechanical concepts. The store of knowledge accumulated by the West is something that is without peer. The anatomical changes undergone by the body down to the molecular level, the role played by the fluids in the body, the aetiology of different diseases, the nature of the action of different medicines, and discoveries of new medicines have been studied to a remarkable degree of accuracy and depth. Modern medicine has pressed into service chemistry, physics, biochemistry, and biology. New vistas for study, e.g., electron microscope, gas chromatography, laser beam, X-ray, labelling with radioisotopes, treatment with radioactive isotopes, electric shocks, etc., have opened up altogether undreamt of fields of study. But with all these amazing achievements, the Western system is wanting in a synthetic approach and a unification of the different data.

To quote one instance, work on ageing has shown that the average human life span cannot rise beyond 90 for the reason that the DNA begins to give wrong signals resulting in "mismade" cells and in the colloidal state being transformed into the crystalline state. Moreover, the nerve cells refuse to grow after a person attains a certain age. Transplantation is also up against a *cul-de-sac,* for, in the ultimate analysis, life depends upon the brain and the latter, despite the advances made in dialysis, heart batteries, artificial heart, and what not, remains something in the fiction, not reality.

These and many other aspects have prompted two well known modern physicians, Pearson and Willey to say that, as in other fields of study, so in medicine mankind has reached the crossroads and a stage where it is imperative for it to assess its environment and prevalent circumstances, to adjudge and scrutinize the achievements registered by the present-day achievements, to derive results from the observation about the aetiology and physiology of disease, to take stock of the different methods employed to check diseases, and so on. The time has come, they claim, to correlate the magnificent treasury of the knowledge of medicine and to garb it with a better approach than has been the fate of allopathic medicine hitherto.

Gruner'" has tabulated the basic points of difference between the *Canon,* and modern medicine as follows:

The Canon	Modern medicine
I. Speculative "medicine". Certain fundamental principles, e.g., cosmology, psychology, metaphysics etc.	
II. Practical medicine	
A. Application of I to the study of (i) health, (ii) disease (tendency, predisposition, threshold stage, declared disease), (iii) cessation of life.	A. *Principles of Medicinal Theory:* The application of the facts of chemistry, physics anatomy, biology to the systematic description of innumerable 'diseases' classified as far as possible on the basis of the microbial theory. Symptomatology, Aetiology, Diagnosis.
B. Actual treatment of "disease" by (i) regimen, (ii) drugs, (iii) operative interference.	B. *Practice of Medicine.* a) Laboratory work b) Therapeutics, pharmacology and dietetics; c) Surgery; d) Gynaecology and obstetrics; e) State Medicine: Hygiene in all its branches; f) Psychological Medicine: Treatment of insanity; and g) Legal medicine, etc.

Gruner further explains:

"Modern medicine is based on the conception of the universe as a conglomeration of dead matter out of which, by some unexplainable process, life may become evolved in forms. To Avicenna the whole

> of the universe is the manifestation of a universal principle of life, acting through the instrumentality of forms. Or, again, in modern medicine, the forms are the source of life; to Avicenna they are the product of life."

According to Muslim philosophy, the basic mission of life is to procreate and the highest peak of the evolution of life is man. Paule Rey[26] says in this context:

> "Avicenna, the Arab physician and philosopher of the tenth century, had inherited the medical and philosophical ideas of the Greeks and, above all, of Aristotle. He had studied all the sciences cultivated by the Greeks. They were not, as today, parallel routes touching sometimes, but they were subordinated one to the other and all of them to philosophy."

Colonel Mazhar H. Shah, a practitioner of Western medicine, commences his paper "The Constitution of Medicine," with the remark:

> "A consideration of this subject should be of interest at the present time when many are desirous of seeing the development of a more suitable system of medicine than the prevailing Western system."

He also says:

> "It is not for me, a practitioner of the Western Medicine, to eulogize the many contributions which it has made towards the alleviation of human suffering and happiness of mankind. I would like it to be considered that, though its advances in the technical side have been more remarkable, its theoretical structure continues to be presented to the student in the form of unconnected detail. Being based on science, Western Medicine rightly begins with a study of physics, chemistry, and biology, but though psychology has yet to find a place in its curriculum, two years of the I.Sc. have to be spent in learning these subjects as pure science. In the preclinical studies long hours have to be spent over detailed anatomy, physiology, and pathology, though it is generally accepted that a good deal of this could be helpfully pruned from the education of general practitioners and the remainder taught in a correlated manner. During the years of clinical study, too much of the time is devoted to the study of specialized techniques, though it is well known many of these are of doubtful value in daily practice. Due to the undue emphasis on

> training in the laboratories and post-mortem rooms and with insufficient attention being paid to the bedside and fieldside study of man, the student finds himself in actual practice ill-equipped to deal with even ordinary problems without the help of X-rays and laboratories. Hence the time and expense in diagnosing and treating is generally so great that the fruits of this system can only be enjoyed by the rich few. If medicine is to cater for the rich and poor alike, and its knowledge is to be made more widely available for the common man, we, the doctors, must join hands in reforming the Western system."

Colonel Shah's conclusion, therefore, is, and which he elaborates further in *Principles of the Greco-Arabian. System of Medicine for Drug Research* that rationalization of Western Medicine is possible through its blending with the Greco-Arab system. Colonel Shah concludes:

> "A theoretical study of the Unani system has, however, convinced me that it is not so much the investigation of Unani diagnosis and treatment as of the basic principles of this system which is likely to yield more fruitful results."
>
> "... Until recently science had led us to believe that the fundamental reality behind the constitution of all objects was matter and energy. Hence organization was regarded as being due to the action of efficient causes on material causes ... From the recognition of "purpose" in biology, medicine enlarged its concept of "mechanism" by postulating a psycho-physical parallelism between a separate body and separate mind. Now that science has come to the conclusion that matter-and energy can no longer be regarded as being separate from one another and that behind them both lies a common energy, medicine has begun to realize that man is neither a mere machine nor just the addition of some separate mind to a separate body but an organism which acts as a whole. Western medicine has, however, still to give us a coherent account of the physical and intellectual aspects of man as a whole and to indicate his various relations both within as well as without in his apparently dead environment."

The Greco-Arab System and Drug Research

Robert Rodale, Editor, *Prevention,* (monthly) and Colonel Shah subscribe to the view that greater attention should be paid to the Greco-Arab system. The former believes that the element of cure is latent to

a far greater degree than in modern medicine; and that treatment based on natural drugs is less drastic, safer, and healthier. He says further that the virtues of Greco-Arab medicine are beyond the ken of the intellect or the reach of experiment, as their fountainhead is spiritualization, and that, despite the achievements of synthetic organic chemistry, it would be considered not only useless but ridiculous to pursue the principles of Greco-Arab system. But, he believes, the time has come for the principles of Greco-Arab medicine to be examined afresh and assessed in their true perspective.

Pharmacological investigations conducted in the Indo-Pakistan subcontinent has been confined mostly to the active principles, and a major part of this work has been performed according to the techniques adopted from the West. Once the active principles have been extracted, the inorganic or the mineral moiety whose importance is no less great, is left over. The same thing happens to many of the ancillary natural chemicals and vitamins. These active principles are then employed for testing upon animals, although the characteristics of the medicines described in the Greco-Arab system are those that relate to a whole drug, and not its active principles, and are meant to express their effects upon human beings. It is well known that a by-product like morphine from opium differs in its properties from opium *qua* opium. The same thing applies to the active principles isolated from the Meccan *senna* (*Cassia acutifolia* Del., *C. angustifolia* Vahl., and *C. obovata* Coll., etc.), e.g., sennoside 'A' and sennoside 'B', the laxative principles isolated from the plant; and the aloe plant, its active principles being aloin, isobarbaloin, emodin, a crystalline glycoside barbaloin, etc. The composite effect of a drug can, therefore, be assessed in the light of the principles and actions of the drugs.

Ancient principles, going to the very age when the primordial consciousness of man had its birth, are valuable in the extreme. Under the influence of Francis Bacon and his successors, the Greco-Arab system was relinquished when all those things appeared as either quaint or beyond the range of the intellect. But now science is evolving new vistas of approach. Extra-Sensory Perception (ESP) is an example of this approach. Thus even science has agreed that there are things that are extra-intellectual and that they should be accorded a place according to their characteristics.

Speaking about modern medicine in a paper, 'The Progress and Present Aspects of Science' (*British Med. J.,* 4335, Feb. 5, 1944), Sir Robert Hutchison says about it that,

> "though favourable to the accumulation of facts, it is bad for philosophy of knowledge."

He further adds:

"There is little speculation and too little use of imagination; and most scientific literature is barren in idea."

The selection of a drug in Tibb depends upon the following:

i) the Galenic nature and grade of the drug;
ii) the dosage of a drug both with regard to potency and weight;
iii) the time of its use;
iv) the nature of the disease; and
v) the contrary nature of the drug in respect of its characteristics and nature.

The Greco-Arab practitioners of medicine emphasize the use of a drug on human beings. According to its approach, howsoever rigorously a drug might have been tested on animals or on individual organs, its preliminary characteristics are hard to be put to test without taking recourse to human beings.

Then, again, it is not sufficient to determine the Galenic grade of a drug or to keep the benefit that would come out of it in view. It is essential at the time of its use to exercise the utmost care with regard to the age of the patient, his virility, weight, mental and psychic state; digestive capacity, condition of the intestines and humours, nature of the disease, the weather, climate, the environment, eating habits, occupation, mode of living, etc. The manufacturer of medicines has to bear the availability of the drugs in mind, and also whether the drug in question is of the best possible variety. If the latter is not available, its succedanea have to be used, but only in the event of its non-availability. The herbs or drugs have to be collected at the right time and carefully stored and preserved. The Greco-Arab system cannot admit of the slightest degree of adulteration and rigid standards of purity have been devised for them.

The conditions and the methodology of the Greco-Arab system are as given below:

1. That every drug should be experimented or tried upon the human body.
2. That each drug should be safe from external and internal changes.
3. That the trial should be commenced in opposing and straightforward circumstances.
4. That the drug should be near the standard with respect to characteristics and dosage.

5. That only such observations as have been made consistently should be recorded.

There are two advantages which, according to Colonel Shah, can be derived from Greco-Arab medicine. One is a benefit of immediate nature and practical, while the other is of a long-term nature and relates to the basic nature of the action of drugs.

Speaking of search for simpler remedies, Colonel Shah (*Principles of the Greco-Arabian System of Medicine for Drug Research*) says:

> "This type of research should be directed towards finding cheap and efficacious but harmless drugs of general nature, which could be used symptomatically in the homes and at the level of the dispensaries and outpatients. For it must be remembered the great many maladies of everyday life ... are of a minor nature ... Unani drugs, intelligently used, could prove sufficiently practical and have a wide enough range to cover most of these complaints. The highly potent and efficacious drugs of modern medicine, though specifics for specific conditions, are entering the market with such glowing accounts of their efficiency from the pharmaceutical industry that, in the absence of a national formulary, they are apt to be taken up by the general practitioners as a panacea for all ills; quite unconcerned about their cost and whether they will produce the proper effect or not. To cite only one example, the antibiotics are being misused daily for common cold and many other ailments which are known to be refractory to these drugs. It will be a great boon to the underdeveloped countries, if, by providing a pharmacopoeia of simple, safe, and cheap remedies we can stem the rising tide of iatrogenic diseases from patent drugs and also save some of the foreign exchange now' being spent on imported drugs. A rough and ready symptomatic approach would always be necessary in the diagnosis and treatment of disease, especially at the periphery of the health services, where science is not likely to reach efficiently and economically for a very long time.

This viewpoint of a patriotic and impartial doctor of Western medicine is worth consideration.

The House of Hamdard has in its stock some one thousand drugs of everyday use, and which are manufactured by means of the most modern machinery. A very large part of natural drugs demands further investigations, and, while precise data are not available, only 2-3 per cent

of the total natural wealth has been surveyed. There are many plants that require further investigation and many that invite research.

The *Practitioner,* in an editorial (1950), *Indigenous Herbs,* discussing herbs, says:

> "It may well be that here lies one of the major contributions that countries, such as China, India, and Pakistan, can make to the development of world health. Certainly this tendency should be encouraged by their colleagues in the West. We, in the West, have learned much from the old cultures; the East can contribute much of value in yet another field – that of therapeutics."

There is distinction between the methods of treatment adopted by the allopathic and Greco-Arab methods. In the former, the physician, after examining the patient and relating the symptoms to some specific disease or ailment, commences his treatment. The Greco-Arab system neither employs machines nor complicated equipment for diagnosis. It is not also concerned with partial approaches. It takes into account the patient's total condition, his environment, and his temperament and, wherever it detects any lacunae, corrects them.

Recipes/prescriptions in the Greco-Arab system are generally based on natural drugs. Every prescription, comprising simples, is based on the temperament of the person to be treated, the synergistic action of the compounded drugs, and collective action. The objective of such a treatment is not to treat the so-called disease, but to reform the whole external and internal biotic environment. The simples within a prescription/ recipe can be changed, if so warranted by the temperament of the person to be treated. The preventive aspect is kept to the fore from the beginning to the end. The hakim does not distinguish between aliment *qua* aliment and medicine *qua* medicine. He uses drugs that are nutritive at the same time and it is quite possible that it is because of the vitamin and minerals, these natural drugs confer advantages upon the patient, although the hakim, in general, is not familiar with their actions and nature. He associates the characteristics of a drug with the bodily hygiene of a person.

It is now rather germane to give definitions of what in Tibb are meant as primarily or secondarily hot, cold, dry, or moist drugs. A hot or cold drug of Tibb need not mean that the temperament of the drug itself is hot or cold. What is implied is that the drug, after acting with the innate heat of the body generates a greater or less degree of heat than what is present in the body itself. A medicine which is hot for humans may be cold for the serpent. The same drug, may be hot for one individual and less so for another.

Colonel Shah rather sympathetically echoes the approach of Tibb[27]:

> "From this account we can see the reason why the Unani hakims insist on the trials of indigenous drugs being made on human beings and their actions assessed from the changes produced by the drugs as a whole on man as a whole. An estimation of the elementary qualities from the colour and smell of the drug itself or from the action of the drugs on animals or on individual organs would thus be purely speculative."

The aim of drug research should be the discovery of potent drugs and yet without side effects (such drugs can only be natural) and, moreover, they should be within the reach of the common man with regard to price-structure.

The basic philosophy of the Greco-Arab system is essential for an understanding of the different approaches adopted by it *vis-a-vis* allopathic system which is, at a substantial degree, based upon the synthetic imitations of natural drugs.

The basic difference is that in the Western system the syndromes or symptoms are thoroughly examined and the effect of a drug or a combination of drugs on the symptoms. The chemistry of the body is also subjected to a close scrutiny and by means of the drug, return of the metabolic system to its original state is sought. There is no harm in such a treatment provided that the whole of the metabolism (or innate heat) of the body is kept in overall view. But the target of the synthetic drugs is mostly the symptoms and their aim is the removal of these, not the restoration of the body as a whole to its original state. Unlike this approach, Tibb takes an overall view of the bodily metabolism and to restore its equilibrium without side effects and in order to obtain better results.

Greco-Arab medicine has had a history spanning untold centuries and the replacement of one aspect by another throughout this period has been its mark of distinction. It has an unbroken history and each aspect of it has been carefully examined. It is true that it is lacking in the intensive experimental physico-chemical, and bio-mathematical data. And yet it is safe from the side effects of synthetic drugs and contains an extremely rich armamentarium of drugs, herbal, animal, mineral and marine.

One keynote of Tibb is that the drug should be such that it should not serve as a quick curative and in the end generate serious side effects. Another aspect of its approach is that the temperament should be allowed to function according to its own nature and speed under the operation of the natural laws, and that this functioning should be given help in every possible way. The aim would be to invigorate the health and

to strengthen the temperament, instead of trying to impose vigour, as it were, forcibly against the nature of the body so as to break up the symptoms resulting in metabolic disorder and chaos, indicated by side effects.

The use of natural drugs is the oldest method for treatment, especially as the selection of the drugs has not been made through clinical trials or logic but through an unbroken series of trials, and for which reason their efficacy should not be in doubt. If anything, centuries of experiments have made them more reliable and trustworthy. Even, if the characteristic of a drug has not been elucidated or understood, its total effect is well known, and it can be relied upon even if it has not been explained as to its different or partial characteristics.

The age of allopathic medicine, on the other hand, is far less and the use of medicines based upon it have been in use for comparatively far less a period. Sulpha drugs and antibiotics have been in use for less than four decades. The use of these drugs has, however, thrown medicines off the balance. They are, no doubt, very potent drugs but their use and efficacy should be weighed against their disadvantages. Whatever part they are said to cure they do not strengthen and weaken them permanently and even the parts that have not been infected are impaired and its side effects are often of rather serious nature. The symptoms that appeared originally reappear so much so that, while, on the one hand, they are equated with a panacea, additions have been made to the syllabi with respect to ways and means for counteracting their side effects.

Views of Different Authorities on Temperament and Humours

Arthur Guirdham, speaking about elements and humours, writes[28]:

> "If we look back over the history of the philosophy of medicine in Europe since the age of Aristotle, I think we can summarize by saying that the first theories of disease insisted on some intrinsic and determining factor in the personality of the individual. After the lapse of centuries, and following several ephemeral flirtations with other hypotheses of disease, we are returning to a conception of morbidity based on, and in its varying manifestations coloured by, the innate and vulnerable nature of the individual."

Henry E. Sigerist'" in the same vein says:

> "The theory of the four humours could also be used to explain the various constitutional types of men. No two individuals are the same, to be sure, but one can distinguish certain groups. There are

tall and short, fat and lean, intelligent and dumb, irascible and sullen individuals. It was observed in antiquity that certain physical and mental qualities occur in definite combinations. Stout persons are usually good-natured. The devil is never painted as fat, for this would have made him a good devil. The humoral theory seems to explain these differences. It was assumed that one of the four humours could slightly dominate *dia physin,* that is physiologically, without causing disease."

Thus, if the black bile, the *malaina chole* dominated, the individual belonged to the melancholic type which Aristotle described in the *Problems.* It was a type to which many men of genius belonged, philosophers, statesmen, artists, but a somewhat unbalanced type which today we would call manic-depressive, people who sometimes are in high spirits and sometimes deeply depressed. Later these types were related to planets. The melancholic man was the Saturnian man, that Albrecht Durer has pictured on his well known woodcut.

Similarly, it was assumed that the blood, the phlegm and the yellow bile could dominate physiologically, and the Arabs described the sanguine, phlegmatic, and choleric types. These views persisted for a long time, and it is impossible to understand Shakespeare's plays if one is not familiar with them.

I have discussed the theory of the four humours ..., because it had a most prolonged influence on medical thought and because it illustrated most graphically the philosophic interpretation of disease. Every medical theory is based on observation and reasoning, and every period thinks with the concepts available at the time. The humoral theory was the result of many brilliant and correct observations. It was logical, explained many phenomena of health and disease, and gave valuable guidance to the medical practitioner. It was not scientific in our sense of the word: nobody had ever seen the black bile, and the qualities, hot, cold, dry, moist were not physical concepts. Sea water was considered dry, pepper hot, while the rose was cold. Qualities were not measured but assumed logically on the ground of certain observations. There was science in antiquity, highly developed mathematics, physics, astronomy. Scientific experiments were made in biology too, but the scientific means were not available for an interpretation of health and disease, and the need for a comprehension of these phenomena was satisfied by philosophic speculation.

The theory of the four humours was by no means the only one in antiquity. As a matter of fact, it was fully developed rather late and much more influential in the Middle Ages than in antiquity.

Other interpretations of disease were given. While the Hippocratic physicians considered the humours the most essential factors in the genesis of disease, others held the solid particles to be more important. Under the influence of the atomistic theories of Epicurus, Asclepiades, in the first century B.C., developed a new theory and laid the foundation for a new school. According to him, the human body was built of atoms, which joined to form the structural parts and were in constant motion in the pores of the organism. Health prevailed as long as the atoms were able to move freely; disease developed when the motion was disturbed. The disciples of Asclepiades, elaborating his doctrine, reduced the vital process to two basic functions, namely, contraction and relaxation. They assumed that all solid parts had the faculty of contracting or relaxing. Disease was nothing else but abnormal contraction or relaxation in some part of the body. The theory led to a simple method of treatment, and the followers of this school were called Methodists. Some of the best physicians of antiquity belonged to it.

Neo-Hippocratism

Neo-Hippocratism has been defined as constitutional medicine or individual medicine by R. Hutchison. A.P. Cawadias (Neo-Hippocratism) believes the term, "individual medicine," to be inadequate, because even the organism and bacterial causalism – the doctrine that preceded Neo-Hippocratism – admitted individual considerations.

Neo-Hippocratism aims at blending modern medicine with the bodily constitution. Constitutional medicine' concentrates at the constitution of the patient, the *physis* of Hippocrates, "the condition of balance of the integrative system of the body, or the psycho neuroendocrine system, as some now would say."

The present-day experts of Tibb are also making efforts at evolving some such system. After all, when modern methods and techniques in the preparation of tablets, pessaries, and suppositories have not been eschewed, why should the discoveries of the modern era be? Nutritive extracts, containing proteins, hormones, and vitamins can be given and arrowroot, a New World drug, and *Rauwolfia* spp., an altogether new drug, has been added to the Greco-Arab *materia medica.* The difference is that in the West, Neo-Hippocratism represents the re-education of the West in Hippocratism and in retaining harmony with Nature, whereas in the Indo-Pakistan subcontinent the effort is directed towards the application of modern methods in the study of medicine, e.g., chemical analysis of herbs, plant taxonomy, pharmacognosy, etc. There is every possibility that all the systems of medicine are gathered into one composite whole

and become a universal medicinal system. This can be possible only when there is a spirit of dedication and realization of the situation, and when the different schools of thought have come out of their narrow shells of parochialism, irredentism, egoism, selfish ends, and commercial interests, and the dioptre of vision becomes corrected.

The twin concepts of organism and bacterial causalism has dominated contemporary medicine. This concept has achieved wonderful results in bacteriology, aetiology, symptomatology, etc. But now the results of these advances are coming to the fore, and many of them are detrimental.

Greco-Arab system also, like the modern system, classifies diseases, but the difference is that, in the former, the organism is to be regarded as a whole and a biological unit. All organs, cells, or organic structures are interrelated and interdependent and have no existence except as components of a corporate whole. The unit of life, therefore, cannot be one organ, part of the tissue or structure but the whole organism, the whole man, in short.

It has been proved by science that disease results from the interplay of various factors to which our body organism reacts. A.P. Cawadias has put forward the conception which is at the basis of Neo-Hippocratism as follows:

> "We thus must consider aetiologically in any disease a series of external aetiological conditions, comprising modifications of environment and a series of constitutional factors comprising factors of resistance. Every patient, therefore, offers for review a constellation of aetiological factors differing in grouping from that of every other patient."

This principle of aetiological constellation (a term introduced by Tendeloo) or constitutionalism (a term introduced by Verworn) is offered to the principle of causalism, mainly bacterial in nature, that dominated medicine even a few years ago.

The inadequacy of the causalistic conception has been demonstrated even in respect of the external factors. In epidemic diseases the micro-organism is not everything, as has been shown, for example, by Sir William Hamer, Dr. Crookshank, and Dr. Goodall. Other external factors must participate in the genesis of epidemic diseases, particularly meteorological factors. This is a revival of the Hippocratic *Catastasis,* which was developed by Sydenham, although inadequately translated as "epidemic" constitution. From a more philosophical point of view, it consists in consideration of all modifications of the macrocosm.

Causalism was demonstrated as insufficient also because it failed to take into consideration a series of important aetiological factors, the factors of resistance of the body which are summed up in the term

diathesis or predisposition. Professor Ryle has defined diathesis as a transmissible variation in the structure or function of the tissues rendering them peculiarly liable to react in certain ways to certain external stimuli.

Diathesis or predisposition depends on the psychological make-up of the individual, in other words, on his constitution. This is why we consider diathesis and constitution as practically synonymous. Constitution means the psychological make-up of the organism in relation to its disposition to disease.

It has been proved beyond doubt that, before the onset of humoral disorder (resulting in metabolic changes), the whole body undergoes a change which, in modern terminology, means a metabolic transition. It has also been shown that before the occurrence of a local change and, in fact, without being accompanied by it, the nervous system undergoes a change, resulting in the breakdown of the rhythm, and, before the assertion of the organic change, psychological and neuronic changes figure to such a degree that these manifestations evince themselves on the facial muscles, colour, face as a whole, and in the body.

The nature of the constitution was studied from the Neo-Hippocratic viewpoint in three stages:

i) the morphological which was developed simultaneously by Benke in Germany and da Giovanni in Italy, according to which, to use da Giovanni's words, "the cause of the special morbidity of an organism resides in its special morphology";
ii) the second phase – that of the biomedical or metabolic viewpoint, according to which the difference between individuals is chemical; and
iii) the third phase – that would approximate to Tibb's and which is integrative or enlarged endocrinological.

It might be worthwhile to quote A.P. Cawadias again on this score:

> "Constitutional thinking has helped development of psychotherapy. The psychoassociational cortex belongs to the system of integration of the body. It is, in fact, the summit of integration. The psychoneuroendocrine system is the system that fights against external morbid elements. Thus by reinforcing the psyche by means of psychotherapy we obtain therapeutic results through the mechanism of constitutional treatment. Psychotherapy is a major biological or constitutional treatment, and its significance has been enhanced by the recent demonstration of the physiological connexion between psychoassociational cortex, vegetative nervous system and

endocrines, and thus between the psychoassociational cortex and all organs and tissues of the body.

"The wonderful development of physical medicine ... is another manifestation of constitutional thought in therapeutics. Physical methods do not cure arthritis or nephritis or nervous diseases as diseases, but they improve the constitution and thus help the patient to fight his disease.

"Pharmacotherapy has been modified markedly according to constitutional conceptions. The haphazard and empirical use of drugs had resulted in the drug nihilism of our immediate predecessors summarized by Oliver Wendell Holmes when he said that, if all drugs were thrown into the sea, it would be so much the better for humanity and so much the worse for the fish. Drugs have come into the foreground again, but are now being used on quite different lines."

It is the innate characteristic of every normal organism to rid itself of the elements deleterious to its wholesome existence, Every living organism, therefore, aims at meaningful living. In other words, in order to keep oneself alive, to develop and evolve one's personality, and to immortalize oneself – these are the stuffs life is made of. It is a unique gift from the Creator to man and, to a lesser extent, all animals and plants: this, in the Hippocratic terminology, was called *physis* and is called by the moderns the *vital force.*

The mechanical concept of disease, as opposed to the constitutional; according to this concept, a disease is the result of external factors which would act upon a body as they would like chemicals or a chemical on an inorganic substance or mineral. This conception of disease is the direct outcome of the mechanistic conception of disease, which believes life to be the result of external forces, of various stimuli, according to John Brown.

Causation and Temperament

Disease is the result of different external forces or conflicts and of the resistance put up by the organism. We have, therefore, in every disease to consider the nature of the causal chain and of the defence mechanism put up by the organism.

This conglomerate of causes is opposed to the bacterial concept which is to this day the staple doctrine of Western medicine; although it has been shown that in epidemics also the germs are not everything but that other factors also play their roles. External factors (especially the environmental, about which Ibn Sina has already remarked) cannot be

dispensed with. This, in fact, is a reversion to *catastasis* or the theory of temperament, and the nature of disease is linked to the bodily structure of a person.

This problem has been highlighted from a different aspect by George H. Schneller, namely from the point of view of drug reaction[30].

> "If digoxin and digitoxin were still new drugs, one could hope that molecular modifications might yield derivatives with a wider separation of the effective and the toxic dose. But that course has already been followed a long way toward the limits of fruitfulness, and there is little early prospect of the currently popular products being superseded by superior analogues. Consequently, the only available means for achieving a reduction in the incidence of "adverse reactions" from this indispensable group of drugs is improvement in every aspect of total regimen."

What this regimen would be is not difficult to guess; it will be the determination of the blood plasma concentration and the consequent clinical effects, clinical nonequivalence of digoxin tablets from different sources, and so on. The author emphasises the fact that the literature on drugs in the USA has the approval of the Food and Drug Administration, and yet the same department has taken off cyclamates from its approved list and now another artificial sweetener, saccharin, is also being reconsidered. This bears out our contention that the time within which these drugs have been under study is far too short to constitute the continuous experiences that characterises Tibb. In fact, knowledge about microorganisms was in existence during the early days of the Greco-Arab system: only the present-day system has neglected temperament .and humours. Neo-Hippocratism reflects the tendency of the modern period to take stock of humours and temperament, although its scope at the present moment is far too limited.

The Therapeutic Principle of the Greco-Arab Medicine

Greco-Arab medicine follows neither the nihilistic system which, in the mid-nineteenth century had reached more than modest proportions in Vienna nor the mechanical school. One might, in fact, say that the Viennese anatomo-clinical school had stretched the concept of the *vis medicatrix naturae* to its extreme end. A.P. Cawadias puts the underlying concept of this school rather graphically:

> "The physicians of Vienna found that patients fared better when left alone ... If Nature be the only physician, then let us not interfere.

> There are two sorts of diseases, those which Nature is incapable of curing and will, therefore, prove fatal despite medical intervention, and those which Nature can cure and, therefore, need no external help. The Viennese summed up this conception in a cruel phrase: 'There are no good or bad physicians, but simply lucky or unlucky physicians.' The best thing that patients 'could expect in the Vienna of those days was to be diagnosed by Skoda and autopsied by Rokitansky.'

An extreme example of the mechanistic concept is the chiracist school which we have discussed earlier. Cawadias again points to the gains recorded in the more recent past by the constitutionalists or Neo-Hippocratists:

> "Dietotherapy, which looms so large in Hippocratic medicine, has also been developed on biological or constitutional lines. The aim of modern dietotherapy is the strengthening of the constitution, and to do this we look at the whole man and not at a diseased organ. In chronic nephritis, for example, until a few years ago, the object was to spare the kidney, and thus we reached the method summarized in the saying of a French clinician, 'Le lait ou la mort.' Nowadays we look on the whole man and endeavour to improve his constitution by giving these elements of nutrition which qualitatively and quantitatively maintain his strength."

Thus the basic approach in Tibb is to strengthen the body. Arthritis, nephritis, and nervous diseases are such that they tend to reject artificial or superimposed therapy. Nutritive treatment, anticipating protein, hormone, and vitamin deficiencies, is a built-in part of the therapeutic regimen of Tibb.

The re-effiorescence of Neo-Hippocratism has resulted in the introduction again of home remedies like the old alteratives, purges, and other drugs with which, in the older time, the physician used to purify the humours and tranquillize the nervous system. Bernard Aschner in the USA has treated many diseases through constitutional therapy. His publications on this aspect of constitutional therapy has had considerable impact in Germany and Austria, and the alteratives introduced by him were those used by Paracelsus; he has obtained good results in gynaecological affections and in other local diseases.

Turning now to Bernard Aschner[31], we find him saying:

> "If we study the books of Hippocrates from a practical view, we find, besides the usually discussed subjects ... an enormous treasure

> of therapeutic wisdom of eternal value, largely unknown and unutilized today. I wanted to demonstrate this fact by one of the most important conceptions of Hippocrates which says that the majority of all diseases does not come from without (like injury or infection), but from within by overfilling with foodstuff, blood and superfluous or corrupt humours, that we call metabolic products. Consequently to the conception of overfilling the six eliminating (evacuating) methods (according to the principle "contraria contraries"); purging, vomiting, sweating, diuresis, bleeding and derivation through skin (cauterization) were the basis of a most effective general treatment until the beginning of the nineteenth century. These methods were discovered and developed partly by chance, instinct, and experience, partly by imitation of the healing crises of nature itself (like critical sweats, diarrhoea, rashes, diuresis, haemorrhages of the nose, piles, etc.). But just these fundamental and true Hippocratic methods have been discarded, and I wanted to show that their critical, careful revival and reconciliation with modern methods gives surprising results just there, where experimental medicine declares the condition as acute and dangerous or chronic, obstinate and incurable. Especially for the actual socially so important problem of refractory chronic diseases Neo-Hippocratic constitutional-therapy often brings effective help ...".

Aschner gives the example of bleeding in the form of venesection, leeches or cupping with scarification which was often resorted to in the Greco-Arab system but whose place has been taken by drugs and mechanical devices. Aschner believes bleeding to be an essential part of the deplethoric, antiphlogistic, antispasmodic, and antidyscrasic mode of general treatment. Aschner further says:

> "Nearly one-third of the mortality rate in the United States – is caused by diseases of the heart, like angina pectoris, coronary thrombosis and blood vessels, e.g., hypertension and cerebral haemorrhage. Traditional medicine and its modern revival in the form of constitutional-therapy are getting better results in treating not only the wall of the heart and the blood vessels as experimental medicine does (Solider-pathology) but influencing its content, the blood (humoral-pathology), quantitatively and qualitatively by different forms of bleeding and by drugs, which change the quality of the blood by a kind of chemotherapy, worked out already by traditional pharmacology. Such blood-thinning, anti-phlogistic and detoxicating drugs are, e.g., saltpetre, ammonium chloride, the alkalis, the saline laxatives, mild preparations of mercury and antimony and many

> vegetabilic drugs (like sarsaparilla), altogether outmoded today. Former Hippocratists often stated that bleeding piles protect the individual to a certain extent from cerebral haemorrhages, asthma, angina pectoris, and some other severe conditions. Heberden, Laennec, Hufeland and other authors of the seventeenth and eighteenth centuries claim definitely that they could cure angina pectoris very often by small venesections and especially by leeches put upon the region of the heart and moreover upon the rectum, in order to drain the portal vein and thus to imitate the self-healing power of nature. In Europe, the surgeons have reintroduced the use of leeches in case of thrombophlebitis, but still hesitate to do the same in coronary thrombosis, although this would be analogous, obvious, and most helpful. In a recent paper we could read that premonitory symptoms of *coronary thrombosis* sometimes became manifest several weeks before the final attack, but, according to the author, nothing could be done to prevent this danger except rest in bed and expectation. This is pure nihilism."

In cases of thrombosis and edema on both legs after typhoid, the mechanical concept would only provide the regimen of rest in bed and to wear rubber stockings. Modern Hippocratic treatment, on the other hand, would apply leeches, resolving and dispersing liniments like extract of conium, preparations of ammonia, mercury, and lead and internal resolving, detoxicating, blood-thinning means which decrease viscosity and the tendency to form thrombi. Venesection was the staple method in the Greco-Arab system in cerebral commotion and fractures of the skull in order to prevent deadly traumatic inflammation and edema of the brain. Blood transfusion, whilst having its own uses, in that it helps the patient overcome the shock, yet afterwards can lead to inflammation, congestion, and edema. Aschner gives further instances:

> "Another such critical condition is massive pulmonary embolism, e.g., after operation or intravenous injection of certain drugs (e.g., diodrast) as reported in recent literature. Trendelenburg's operation mostly comes too late and is too drastic for the weakened patient, whereas venesection has saved many lives in this condition, as we can read in the text books until the beginning of the nineteenth century. In recent years, two of my followers, Dr. Delvaux in Luxembourg and a young surgeon in Tyrol, published such spectacular results. The patients, apparently given up, were saved in a few minutes by a simple venesection. *Vascular spasms* in middle aged patients, especially after the menopause, often do not respond to the usual treatment with hormones, etc., but

> often disappear after venesection, combined with internal detoxicating (but not narcotic) remedies, apparently removing the supposed spasm-producing metabolic products like uric acid, histamines, etc. ...
>
> "Most important and often of vital decision, is the *anti-phlogistic method* of Neo-Hippocratism, consisting in carefully individualized bleeding, sometimes sweating, blistering, by cantharides plaster and internal antiphlogistic remedies. Let us take the case of an acute, subacute or chronic inflammation of the gall-bladder. Operation in this condition, which mostly concerns individuals in advanced stages of life, is always a major surgical risk, whereas the usual conservative treatment, consisting in rest, bile-salts, narcotics, compresses and heat also is often insufficient. But if we use venesection or leeches in the region of the gall-bladder, or cantharides plaster on the sick spot, internally first enemas of *senna* leaves, later such of saline laxatives and further rhubarb or calomel internally, nearly all cases of cholecystitis can be cured in a conservative way. In case of inflammatory tumours of the female adnexa, leeches and calomel shorten the healing time up to one third ... Moreover, this antiphlogistic method was used successfully by traditional medicine in the most critical cases of meningitis, pneumonia, acute articular rheumatism ... There is nothing that stops so quickly a beginning pleurisy or removes pain and inflammation in a peripheral pulmonary infarct than a cantharides plaster. This has been known for 2000 years, but is neglected completely today."

Purging or catharsis is another method that is of crucial importance in Tibb. The Latin adage, *Qui bene purgat, bene curat,* has not been well appreciated in our time. Cathartics are given today as a local mechanical device, for the evacuation of the bowels and mostly by means of mechanically acting drugs like mineral oil for lubrication and agar in order to increase the bulk of the intestinal content. The classic method comprised resolving, derivative antiphlogistic, antispasmodic, and detoxicating by-effects upon the whole system by a large-scale armamentarium of cathartic agents, which constituted a part of the "indirect general treatment." Health resorts like Carlsbad, Vichy, Saratoga and others are able to break up the renal calculi and gallstones quite often into sand and to eliminate this sand. Aschner draws up a comparison:

> "Official pharmacology still contains a great variety of such laxative drugs with special systemic by-effects. Their individualized choice and combination characterizes the refined and ingenious therapeutist,

> whereas many trends of our up to date mechanized and too much standardized therapy are stereotyped, helpless and monotonous like the exaggerated doctrines of endocrinology, allergy and vitamins (biochemistry). They may be very beneficial, if connected with those classic forms of general treatment, but are misleading, useless, and ever harmful, if applied in a one track mind way."

Classical medicine believed that perspiration or sweating can cure up to one-third of the known diseases. Through perspiration, the skin is cleaned, and each day some 2 lb. of waste, comprising water-damp, carbon dioxide, and other organic products are removed. Quantitative or qualitative impairment of sweating results in a kind of retentional auto-intoxication in the form of rheumatism, arthritis, neuralgia, skin diseases, different inflammations and catarrhs of the internal organs. Sweating, as a method of treatment, is not resorted today, although salicylates are prescribed in acute articular rheumatism, in colds and in many other conditions empirically. Aschner says:

> "Sweating, therefore, is also an essential part of the combined antiphlogistic method, but not used systematically today. It is not irrelevant in what way transpiration is brought on. The purely mechanical conception, to produce sweat, for example, by hot box alone is not always sufficient and often too primitive. Sudorifics like acetic ammonia (Minderer's liquor), wine of antimony, small doses of ipecac and many vegetabilic drugs like pilocarpine, sambucus, verbascum, herba vincetoxi, and others have different effects, apparently provoking different qualities of sweat, in a similar way as some laxatives eliminate more bile, others more water, mucus or salts etc."

The axiom of Hippocrates, that symptoms above the diaphragm indicate the use of emetics, while those below it that of laxatives, might appear rather crude today but is a profound piece of wisdom. Today emetics are given in cases of poisoning, excessive use of soporifics, alcoholic intoxication, or where washing of the stomach cannot be carried out without the purgation of the bowels. Classical medicine, however, had found it possible to cure by employing emetics in certain types of headache, migraine, tonsilitis, parotitis, aphthae in the mouth, acute and chronic indigestion of the stomach, chronic bronchitis, even some forms of tuberculosis (according to Aschner), and especially bronchial asthma. Aschner says that trying emetics consisting of ipecac, scilla, and tartar emetic by giving them to the patients twice a week, he could cure bronchial asthma. He also confirms that emetics quite often suppressed

or cut short whooping cough in epidemics. He gives the *raison d'etre* for the effectiveness of emetics as follows:

> "But the crucial test of vomiting is its fundamental value in mental diseases. Acting upon the vegetative nervous system, especially upon the solar plexus, the so-called abdominal brain, it appeals to the instinct of self-preservation and, therefore, was recognised as one of the mightiest counter-stimulants of the brain. It is also a kind of shock treatment, but milder and less risky than insulin and metrazol."

Aschner holds emetics to be of benefit in a majority of all mental diseases like mania, melancholia, amentia, negativism, stupor, including schizophrenia, if applied during the onset of the disease. Emetics can be combined with drastic laxatives and hydrotherapy besides treating, according to G. Zilboorg, remote symptoms like amenorrhoea, obesity, constipation, full bloodedness, dysfunction of the liver; in short, the whole personality. The use of emetics could reduce the $ 1 billion annual expenditure incurred on mental diseases, and reduce the pressure on mental homes.

Let us again advert to Aschner:

> "There are a great number of similar surprising facts, concerning the tonic method, e.g., in every day stomach disease (atony) the antispasmodic method for all forms of spasms, convulsions and cramps, the antiphlogistic method is an effective general treatment for acute and chronic infections and endogenous asceptic inflammation of all possible organs. The same is valid for the emmenagogue method ... considering menstrual flow as an indispensable function for female health."

The antidyscrasic approach of the Greco-Arab system is perhaps best demonstrated by the examples of arthritis and rheumatism. In fact, Hippocrates and his followers considered arthritis as a metabolic disease – a notion that has been confirmed by medicines like *Indocid.* According to Hippocrates, overfilling with blood and foodstuff may generate swelling and pain in the joints with or without fever and evacuating methods were consequently employed successfully in this condition by humoral pathology. Thus arthritis and related conditions like sciatica, lumbago, neuritis, neuralgia, tendovaginitis, etc., have to be treated doubly, i.e., externally by derivation through the skin, a method that has been given the somewhat superficial name of counter-irritation. Yet it is not nervous reflex irritation that is essential but elimination. The body

metabolism is improved by alterative and antidyscrasic remedies like alkalis, tartaric preparations, calomel, antimony compounds, and several vegetable drugs like colchicum, guajac, aconite, etc. The sulphur, gold, and salicylate therapy of allopathic medicine has, of course, become outmoded and full recognition to these diseases as metabolic in nature has been accorded. Aschner says:

> "I myself and many other followers of Neo-Hippocratic constitutional therapy could demonstrate a great number of cases of arthritis, even such of the spine, refractory to the usual method, but cured by external derivative and internal antidyscrasic remedies. Frequent invalidity and large public expenses could be prevented by general adoption of these established practical methods. The Neo-Hippocratic physician is able to cure sciatica or lumbago often in a few days by artificial rashes and non-articular arthritis of the shoulder or knee-joints in two or three weeks by those methods, whereas the usual way with diathermy, salicylates, etc., takes months and years, often coming to a pessimistic prognosis, because of lacking results.
>
> "Summarizing I wanted to stress that, notwithstanding tremendous .progress, modern experimental medicine urgently needs reorientation of medical thought and practice by Neo-Hippocratism. Besides the highly developed analysis, detailed work, specialization and specific treatment, the addition of Neo-Hippocratic methods of indirect, unspecific, individualized general treatment ... would enrich our therapeutic power greatly. Our results would be better than ever before, because the ancients did not have our modern technical equipment and the up to date medicine has overlooked the inexhaustible treasure of traditional practical methods. Neo-Hippocratism briefly should be a synthesis between rationalism and empiricism, between cellular (solidar) and humoral doctrine, between local and general pathology and, finally, between progress and tradition."

The point, therefore, to be noted from all that has gone before is that there is no central idea or thought in allopathic medicine. The superstructure of the system of drugs which it has built (e.g., synthetic hormones, antivitamins or anti-metabolites in general, antibiotics, hypoglycemic agents, and so on) have their counterparts in Nature. Antihaemorrhagic drugs like the derivatives of dicoumarol are based upon dicoumarol which was isolated from spoilt clover in Canada in the thirties. Thus, even if the mechanistic nature of the present-day Western medicine be conceded even for a moment, its drug armamentarium is mostly derived from natural drugs – or, in other words, it represents the

laboratory imitation of the active principles from plants and other sources. Salicylates are derived from the oil of wintergreen, anticoagulants from Vitamin K, fertility agents from Vitamin E, synthetic antibiotics from naturally occurring antibiotics, and so on. Only the inanimate compound can be said to be subject to physico-chemical laws, where the element of variables is limited. A living body with indeterminate and unpredictable variables cannot be said to be subject to such changes nor can such changes be said to be prognosticated. How else can it be that a drug will not have side effects in one person but will have them in others? The exponents of homoeopathy are correct in holding that the patient first suffers from a disease, and its effects become evident on the organs and metabolism after a short while. As long as the body is strong, it can control the different ailments, whether the aetiology of a disease be due to external or internal factors, and the soul dominates the action of the body. Such a comprehensive view should tend to impart a central or concentred idea to human existence which is not possible under Western medicine. Such a view is beyond any mechanical concept of which biophysics, quantum physics, instrumentation etc., are the indices, and transcends epidemiological concepts which have undergone changes of 180^0 during the last hundred years. Nor it is possible to measure life itself nor of the sperm and the ovary, in which are resident the immeasurable powers of procreation.

We must, however, concede that Tibb has lagged behind in research. A comprehensive view that it offers will not and cannot substitute for clinical and other experiments and the confirmation and the establishment of the validity of a point of view can be put forth on the basis of experiment only. As has been discussed earlier, if modern techniques are combined with the older ones, far-reaching results and advantages can accrue. While theories, for the most part, change with the passing of each decade, experimental results retain their validity.

Galdston, in an issue of the *Bulletin of the History of Medicine,* said, while discussing diagnosis in historical perspective, that reconciliation with Hippocratic diagnosis would redound to the advantage of medicine insofar as "it is practised as the definition of a clinical problem, affecting a given individual, to be solved therapeutically and between the up to date diagnosis of disease as a distinct entity."

He holds the Hippocratic or constitutional form of diagnosis to be far more superior and to be more difficult, whereas the modern system of diagnosis is a more primitive function, a kind of crib, as the philosophers call it, requiring but a moderate discipline. He further believes that it is mostly "accomplished by the utilization of a variety of inanimate instruments. It offers only a narrow and not too stable foundation for effective therapy."

Summation of the Discussion

During the last twenty years or so, Western medicine has found itself in the doldrums, as the various facts which it has unearthed and the experimental corpus which it has accumulated has not resulted in the crystallization of universal dogmas. To quote only one instance – that of cancer – it has been held that environmental circumstances can generate it, e.g., smoking, and that it is due to virus. Against these contradictions the constitutional approach, which in the West has begun to be designated as Neo-Hippocratism, has gained a not too considerable following, and the concepts of temperaments, humours, and the Galenic grades of medicine have been given a new orientation in modern medicine.

An analogous movement has been initiated in Pakistan on behalf of the Hamdard National Foundation (Pakistan). Our aim is to highlight those aspects wherein Tibb has lagged behind – especially in standardization, formulary, drug research, and advances made in the chemistry of the living body.

R.L. Manning ("Where Does Medicine Fit In?") says:

> "In brief, what I have said so far is that changing conditions require changes of outlook in medicine and its practitioners; that we have no reason for complacency about medical progress; and that the ever increasing insecurity and instability of our world brings us, as doctors, face to face with people cracking and creaking under the strain. To this situation specialization provides no answer, for it is the practical negation of spreading interests and universal understanding. The true answer, on the contrary, is bound up with a wider meaning of medicine, as part of biology and of biology as part of a general cosmology. It is only by putting man in his right place – by viewing him in perspective – that we shall realise just how small and insignificant his troubles are. The difficulty is to convince ourselves of our presumptuousness; we have somehow to learn that we are not the centre of the Universe, that we are not different from other forms of life and that we have not even full conscious control of our minds. Perhaps it is just because of our mental limitations that we are so tenaciously presumptuous. We take ourselves very seriously indeed, because we judge ourselves by our limited standards."

Earlier, in the same article, he says:

> "Today we glorify the machine and the ephemeral. We have had Copernicus and Darwin and Freud, we have thrown religion

> overboard; the family and the community group of the village or small town are losing their force and disintegrating. Even allegiance to the state has become depersonalized: patriotism is either dead or equated with dangerous nationalism. No wonder, then, that we have our neuroses and anxiety states. Is it fair, though, to expect the medical profession to shoulder the burden of aching humanity? We cannot, on the face of it, offer any solution to the instability and insecurity of the world. Or can we?"

In the humble opinion of this writer the majority of diseases – except those that are genetic or due to infection – result from intemperate living. And as long as such a mode of living persists, it would not be possible to expect radical improvement in the general health of the people as a whole.

We should, it is suggested, purge ourselves of narrow prejudices, parochial tendencies, and too much faith in one's discipline to the detraction of the other, and we should press into service all kinds of treatment – dietary, temperamental, physical, and surgical – and in the light of the known facts should not follow a particular line blindfoldedly. The aim of treatment is to make a patient well, not the promulgation or the publicity of a particular doctrine or line of thinking. Knowledge is the torch-bearer of truth, sincerity, and righteousness and is not hide-bound to any particular school of thought. Only through such a synthesis can serenity and optimism be guaranteed.

It will have to be conceded that, although general practitioners in Western medicine abound, allopathic medicine has become so specialized that the practitioners have become, on specialization, technicians. The choice of having technicians or physicians proper is up to us. The older system made the physician an eclectic being, who could have the grasp of ethics, philosophy, deontology, and a proper perspective of history. The present-day medicine has succeeded in producing specialists within extremely narrow compartments. They are blissfully unaware of the things that are going on in the world of medicine itself.

It would be, therefore, pertinent to ask: Is it worthwhile to lose all spiritual values and acquire phantasmagorial gains? Is it worthwhile to lose our world of spirit at the cost of turning even the world of science upside down?

How can a man surrounded by giant cyclotrons to generate high-energy particles to burn out sarcomas or laser beams operated at a mass-scale to aid in operation or remove tumours, remain as human as he would otherwise be? This is not to deny the usefulness of such equipment; but the use of such equipment should not be at the cost of the dehumanization of science. The danger signal for humanity is resident

in the greater attention of material ends; the objectives and aims both have undergone a change – and to a dangerous extent. When the moral values show signs of breaking apart at seams, the civilization also would be nearer the breaking-point.

And so we return, whichever way we take, to the basic question: does life have any meaning? The Qur'an (*Surah* XCVI) points the way:

> "Read in the name of the Lord who createth. Createth man from a clot. Read: And thy Lord is the most Bounteous; Who teacheth by the pen, teacheth man that which he knew not."

And so we grow from a clot to fullness in course of time, and then decay and die. And each moment of our life is an indeterminate, unpredictable event. And in man himself there is duality: he is so strong and resilient and yet so weak. Even if he becomes materially strong, he will remain spiritually weak, if the world of spirit is neglected, but neglected at our own peril. One of the greatest Urdu poets, Iqbal, has posited this duality as follows:

> "The freedom of the spirit is the kingdom supreme; the material lucre the portent of death. Choose what thou shalt have, lucre or the kingdom of the spirit?"

Only when we have conceded the supremacy of the world of the spirit can we be really called human beings.

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3. Such as Moses Maimonides, Masarjawayh, Ibn Masawayh, Ibn Biklarish, etc.
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APPENDIX A

MIZAJ OR TEMPERAMENT IN GRECO-ARAB MEDICINE

Explanations and Interpretations

The Greco-Arab medical system offers a conception of the temperament which is very wide. In classical medicine, temperaments were assigned to the elementary substances, then assumed as such, and the temperaments of compounds derived from their compositions. At present in place of temperaments chemical properties of the elements are taken into account and attempts made to derive the properties of compounds from those of the elements. As to the temperament of a substance it relates to its action on the human system. If a substance produces no effect on the human system beyond the normal physiological one it is said to possess normal temperament. But if it manifests a pronounced effect in the direction of heat, cold, moisture or dryness it is assigned a corresponding temperament. This effect, being the result of its chemical transformation and action in the system, is then related to its chemical properties, and not to its elementary composition. Hence, the temperament of a substance is, according to modern ideas, based on its chemical action in the human system. Similarly temperaments were assigned to the members of the human body with regard to their content of the four elementary substances assumed to be such at that time. In the light of modern knowledge of human metabolism these temperaments can be correlated with the metabolic activity within that member. Interpretations by some men of medicine are given in tile following pages.

Definitions and General Enunciation

Temperament is the pattern of activity and reactivity in the body as a whole or its parts. The heat and cold in it may be identified with the dispersive and aggregative aspects of energy while moisture and dryness with the receptive and resistant aspects of mass respectively. It is the

pattern resulting from the interaction of the opposing qualities of elements. The elements divide into minute particles to secure intimate contact with one another. When the qualities of these particles act and react on one another there emerges a new pattern of qualities which is uniformly distributed throughout the particles of all the elements. Since the primary qualities of the elements are four, namely heat, cold, dryness and moisture, the temperament of a newly organized or disintegrating body is a product of these qualities.

Theoretically the absolute temperament is of two kinds:

a) balanced – when the opposing qualities of the temperament are quantitatively exactly equal and the balance is an absolute average of these qualities and;
b) imbalanced – when the qualities of the temperament are unequal and inclined to one side. In medicine, however, such a classification is not valid as a temperament could never be absolutely balanced or imbalanced. The balance or equilibrium in the medical sense does not depend upon equal or unequal distribution of the qualities but on their being equitable, that is, the qualities and quantities of the elements are distributed in such a manner that the resulting pattern (or equilibrium) of the body, as a whole, or of its parts, is the one which is the most appropriate for the human being ... Man, amongst all beings, is the nearest to the absolute balance and, of the various racial patterns, the inhabitants of equatorial zone are the nearest to the absolute balance provided there are no disturbing factors to interfere such as the vicinity of seas and mountains ... Next to the inhabitants of the equatorial region are those living in the fourth zone ... Of all parts of the body the skin of the hand is the most balanced and in the hand, the skin of the palm, and then, in the ascending order, the skin of fingers, the skin of index finger and, finally, the skin of the terminal phalanx of the index finger which is the most evenly balanced.

In modern medicine the terms constitution and temperament are often used synonymously but not so in the *Canon* (of Avicenna). Constitution is *tabi'yat,* comprised of seven physical factors – *umur-i-tabi'ya* of which temperament – *mizaj* – is one.

Temperament is the pattern of activity and reactivity of the body as a whole or of its parts expressed in the terms of elementary qualities, namely, heat, cold, dryness and moisture. These qualities – *quwa* are

neither entirely absent from the constitution of any object, nor are they present in an absolutely equal proportion. Temperaments of objects are, therefore, balanced or imbalanced relatively to one another.

The balance as a medical term, does not, however, mean the equality or inequality in the quantitative proportion of primary qualities but their presence in man in such a proportion that the resulting pattern of the body as a whole or of its parts, is the one which is the most appropriate for him under his particular set of conditions or circumstances and that it is the normal for him. This assessment of a person, though rough and approximate, is not only supplement but encompasses the physical, chemical, anatomical, and physiological aspects of constitution as a whole and thus has the great merit of correlating both structure with function as well as body with mind.

The temperament of man is basically innate due to the inborn strengths and weaknesses of the various faculties but it is liable to temporary changes from such factors as food, climate, rest, exercise, sleep and emotions.

The temperament as defined above has sixteen varieties. Four of these are simple with excess of a single quality and four compound with excess of two qualities. Both the simple and the compound varieties of temperament mayor may not be associated with humoral changes.

The temperament of a person is measured against that of a balanced person under normal conditions. Since the skin of the body and more particularly the skin of terminal phalanges is the most balanced, touch has been adopted as the best means of perception. The body is, however, thoroughly examined by all the five senses, so that the general physique, pulse, feel of the body, type of hair, sleep, work, emotional characteristics and colour of stools, urine, etc., are carefully noted for proper diagnosis.

It is on the basis of this knowledge that *Canon* describes people living in northern countries and those working with water as being moist. Children and youth are stated to be both hot but children are more moist and the young more dry. The middle aged and elderly are cold and dry, but the senile are cold and moist. Women are colder than men. Blood is hot and moist; bile, hot and dry; phlegm, cold and moist; *sauda,* cold and dry. Bones are cold and dry; brain, cold and moist; heart, hot and dry; and liver, hot and moist.

Drugs like other substances are characterized by their own physical qualities but when in medicine a drug is termed hot, cold, dry or moist it means that after its action and reaction in the body it produces a perceptible degree of heat, cold, dryness or moisture in the body. Drugs are graded from one to four degrees according to the strength

of their dominant quality and are used to treat diseases of opposite qualities.

The temperament as defined above is a synthetic concept which expresses the various physical as well as psychological tendencies of the individual in the terms of mass and energy, i.e., activity as heat and cold; reactivity as dryness and moisture. This is a notion of great importance to the clinician both from the point of physiology and psychology as well as diagnosis and treatment, and thus deserves to be investigated with the help of electronic devices. The attempt to describe the constitution of man is not peculiar to Avicenna. On the one hand it is rooted in the *tridosha* theory of Charaka and Susruta and the humoral theory of Hippocrates and Galen, and on the other it is sufficiently broad to cover various structural, functional and psychological approaches made by Kretschmer, Jung, Hurst, Pearson and Wyllie, Hess and Eppinger, Danielopolu and Sheldon, for the study of human physique and temperament in modern time.

Sheldon's and Kretschmer's classifications based on morphology disregard differences of activity such as of a thin person being either a wiry hyperthroid or a sluggish hypo-adrenal. The· clinical classification by Carus and the physiological one by Danielopolu, would appear to be nearest to the four innate types described in the *Canon.* They however make no mention of the associated biochemical and environmental variations.

Pavlov working on the conditioned reflex in dogs calculated twenty-four types of nervous system from the variations of strength, equilibrium and mobility and their possible combination with the basic properties of excitation and inhibition as modes of adaptation with the environment. In life he, however, found four types which correspond exactly to the ancient classification of temperament into melancholic, choleric, phlegmatic and sanguine. According to him weakness of both excitation and inhibition explains the 'weak' melancholic type, strong excitation with weak inhibition the 'impetuous' choleric type, strong excitation as well as strong inhibition the 'calm' phlegmatic, and the 'lively' sanguine types according to their degree of mobility. Since the four types proposed by Pavlov correspond also to the four temperaments by Avicenna it may be hoped that no sooner science is able to measure the heat, cold, dryness and moisture of bodies in precise terms, the identification of excitation and inhibition with heat and cold and mobility with moisture would explain all the equilibrated and unequilibrated patterns of the body.

(M.H. Shah, "The General Principles of Avicenna's *Canon of Medicine"*)

The word 'temperament' is not exactly satisfactory. The Arabic word *mizaj* contains the idea of 'mixture'. So the medieval translators used the words *commixtio,* or *complexio* which carry the idea of mixing or blending, or weaving. But neither word fits in with modern usage. The word 'constitution' is more meaningful to the lay person, as referring to the make-up of the physical body: 'temperament' applies to the mental body or make-up. The word 'constitution' carries the idea of something stationary, unchanging. One has therefore, to use the word 'temperament' in a psychological sense; in a medical sense it should imply a blend of humours, as in the *Canon* of Avicenna. There is a pattern of humours, since all four are present in every individual. But whether the temperament is hot, or cold, or dry, or moist is determined by the proportions of the four elements. This is one advantage to restoring the doctrine of the elements to their original position – they are the common denominator between temperaments, humours, mental make-up, faculties and emotional character of a person.

Relation of breath to temperament and the emotional character:

So close is the relation between 'breath', 'imponderable elements' and 'temperament' that description of the one readily lends itself to being a description of one or both the others. If we trace changes in 'earth', 'water', etc., we are at the same time tracing changes in the activity of the 'breath' and we use words which apply to both 'temperament' of the old sense, and emotional character as spoken of today. Dominance of 'water' is as much as to say "the 'breath' remains in the 'water' phase over a longer period of time than in other phases – in this person." It also goes with *Jemal* type of character, the exact form of manifestation varying according to their factors in the 'make-up', e.g., quiet endurance, silent submission to pain, ardour of aesthetic emotion, keen sense of beauty, love of certain kinds of music, certain colours, flowers, etc. (Note then, how intimate this idea of 'constitution' becomes).

To give another illustration – dominance of 'fire': The following are its modes:

1) the vibration-rate of the 'breath' remains longer in the 'fiery' phase than in other phases and in other persons: or, weeks elapse before it reaches its climax (*Kemal* stage);
2) the temperament is 'fiery';
3) the person is called 'of hasty disposition', 'hot-tempered', he is 'prone to anger';
4) the climax of the fire-element may be reached suddenly e.g., persons of 'explosive' temperament or disposition; the blood 'boils';
5) the associated character is of *Jelal* type, taking different forms

according to the manner in which the patient reacts to the circumstances of life; e.g.

a) possession of great physical strength,
b) pugilistic power,
c) courageous in danger,
d) irascible character,
e) originality of thought,
f) ambition,
g) a person with unshakable gentleness, despite opposition, e.g., in some 'saints',
h) proneness to enthusiastic, beneficent arts,
i) zealous character,
j) cruelty of certain kinds (other cruel persons are called 'cold-blooded'),
k) strong desire. The whole range of human activity can be drawn on for opposite examples.

(O.C. Gruner, "Commentary on the *Canon of Medicine* of Avicenna")

APPENDIX B

TEMPERAMENT OF MEDICINES

Temperament plays a very significant role in the diagnosis and line of treatment in the Greco-Arab system of medicine. Every thing has a temperament of its own, be it a patient, a plant or a medicine. According to this system of medicine the basic qualities of the energy are heat and cold and of the mass, dryness and moisture – their mutual interaction leading to the emergence of a new balance of qualities which varies in quantitative proportion of the primary qualities.

With the somewhat limiting character of scientific discipline through which we have gone, it may not be possible for us to find any adequate basis for probing into the highly imaginative speculations of traditional and modern systems of medicine. There is, however, one particular aspect of study relating to them which may possibly open up a field of investigation parallel in its approach to studies in the correlation of chemical structure and pharmacological action. As we may well concede, studies in such correlation are still mostly in their fact-finding stage and it is extraordinary how few are the generalizations which it has been possible to make on the basis of these facts. The most outstanding among these are the curare-like actions brought about by the conversion of bases of widely varying substances possessing strong physiological activity into quaternary ammonium compounds, and the inactivation of a variety of substances possessing strong physiological activity through the introduction of a carboxyl group in their structure. Reflecting on the so-called 'heating', 'cooling', 'moist', and 'dry' attributes of the drugs in the sense these terms are employed in the indigenous system of medicine, it occurs to me that a far wider basis for generalization as to the relationship between chemical constitution and these characteristics of drugs with reference to their mode of action on the human body might be arrived at in accordance with the theories of the two systems of medicine. In the case of drugs of significant constituents which are alkaloidal in character and thus contain a basic nitrogen atom in a more or less complicated chemical structure, we find that they are considered in the Unani system

as 'heating' and 'drying in character. On the other hand, the plant products in which the significant constituent has a carboxyl group as in the citrus fruits, tamarind and unripe mango, are considered as 'cooling' in nature. In the same manner, the presence of an active constituent with organically combined sulphur makes for the 'heating' attribute of a drug, and products like camphor and a variety of drugs, the significant constituent of which is a terpenic body are generally ascribed a 'cooling' character. There will certainly be exceptions to such general formulations as, for instance, in the case of opium which is an alkaloidal drug but is considered to be cooling. It is just in these cases, however, that a thorough study of the subsidiary constituent could be of great interest, insofar as it may ultimately reveal the extent to which such a variation may be due to them, or to certain structural characteristics of the active constituents of the drug. Such an approach to scientific research in a restricted tangible field will be something quite distinct from a purely abstract consideration of the merits of the various medical systems. It may, in fact, well serve as a starting point for those who subscribe to scientific discipline, and also provide a fairly rational basis for profiting from age-old empirical observations in their long and weary search for factual knowledge.

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APPENDIX C

ETHICAL BASIS OF MEDICINE

Ethics as a basis of medicine is no new concept. It is at least as old as Hippocrates whose famous Oath is administered traditionally to every student of modern medicine. It contains but the ethics of medicine. There is, in fact, no notable system of medicine without some leaning on ethics. Arab Medicine, although not giving currency to the traditional oath, is full of religious and ethical element as is evident from its books and from the many anecdotes preserved in history and literature. In Ayurveda also the teaching of Charaka and Sushruta contained in their magnificent books are golden chapters of medical ethics. So with Chinese Medicine. In it ethics forms the basis of the organization of all life, social and economic: how can then medical life escape its influence?

Medical profession and social relations are, undoubtedly, deeply interrelated. Medicine affects social conditions and it is itself affected by them. It is natural, therefore, that the present social strain is affecting the medical profession and its ill-effects are coming to the fore day by day, and the medical profession which has been and should be a perfect symbol of human sympathy is losing this distinction and public confidence.

In Europe and other highly civilized countries ethical values do exist, though under such names as civic sense, social etiquette, etc., and to a large extent their people organize their corporate life. But in Pakistan and most other Asian countries a curious state of affairs prevails. Their people have lost respect for their own values of life and moral status under the influence of the superficial glaze of modern civilization and have not cared to find out a substitute themselves. And this substitute cannot be obtained so easily, for it requires, after all, time, favourable conditions, and reformation on national scale. The result is that economic strain has brought about serious deterioration in the moral condition of the physicians (which includes votaries of the various systems) of our country, instances of which fill the columns of the newspapers. The government is noticing all this but is helpless. The public is afflicted with

diseases and epidemics with the bane of physicians to boot, and can do nothing but mute protest.

After pondering over this problem we have arrived at the conclusion that as long as ethics is not included basically, unequivocally, and in a definite form in our education and profession and practical life, no solution will be found of our personal, collective and social problems, of which we also form a part.

The voice is sometimes raised even in such highly materialistic countries as England and the U.S.A. in favour of medical ethics and spirituality in medicine, but that voice is not raised with any definite objective or for any basic reform, but is simply an expression of confusion of thought and does not yield any result except personal satisfaction. But we have not to be content with this; nobody is going to be benefited by idle talk. Although the Indo-Pak subcontinent, which is called the cradle of ethics and spiritualism has been deficient in rationalism, we have the duty of presenting the physicians of the world with a comprehensive programme.

No comprehensive programme, especially one which is meant to be universal, can be formed without due consideration and discussion. At present we wish to place before our readers some notes which will help in forming an estimate of the extent to which ethics forms an inseparable part of Medicine, both as science and as an art.

1. Although the flora of ethics has been irrigated by religion, yet it has thrived in an atmosphere of rationalism and logic. It is not correct to hold the view that the possibility of irrigating this flora no longer exists. In the first place, our personal opinion is that religion shall always form an important part of human nature, and specially in countries like Pakistan, according to our opinion, there is no possibility of the disappearance of its influence. And even if this influence goes, human nature will find some other substitute for religion which will be only analogous to it.
2. Ethics is based on rationalism and logic while religion is based on feelings.
3. People can be unanimous on ethics, but not on religion.
4. Practical principles of ethics can be formulated, especially for the science and art of medicine, without indulging in polemics about ethics.
5. Medicine is a science as well as an art. Science is, after all, based on rationalism and logic; but the art of medicine requires, like other arts, some external support. If this support were to be given by ethics, medicine can become entirely rational, and philosophy will form only so much of its part as is practically required.

6. Ethical basis of medicine already exists, but it is necessary to organize and strengthen this foundation.
7. If medical educationists were to accept ethics as a basis, like ether basic sciences and arts, in teaching medicine, there is strong hope of creating all kinds of harmony in medicine – personal, professional, collective, social, economic and political.
8. International principles of ethics already exist, and can be extended, organized and fortified in future.
9. If medicine has to be kept rational no other foundation, whether spiritual or religious, is required more than ethical. Medicine can be made mostly humanitarian only on the basis of ethics and commercial motives can be thus excluded from it,
10. Psychology and psychic diseases will play important part in future medicine. And within its frame, psychological regime will naturally extend in scope which will most nearly correspond to ethical values. If we were now to base this regime, intentionally and with full consideration, on the universal and unifying foundation of ethics, the psychic medicine of the future will be able to fulfil its purpose with greater harmony, extensiveness and profundity and no possibility will remain of its shaking.
11. Considering the importance of suggestion in psychiatric treatment, if a patient were to be given an ethical suggestion in place of general, professional or simply medical suggestion, there will be earlier and more extensive and useful success in the treatment. Psychological soundness is necessary for bodily soundness, and the more tranquillizing (like ethical) is the foundation on which psychological soundness is based the more durable and enjoyable will be the bodily soundness.
12. The ethical basis of medicine and much of its material alreadyexists, as already mentioned, in Unani, Ayurveda, Chinese and, even in modern medicine. We can derive universal principles from them.
13. Ethical medicine is a balanced reaction in place of the purely spiritual trend which is appearing as a reaction to the materialism of the modern medicine, and which sometimes carries away in its current notable medical and non-medical personalities. When this is accomplished, there will no longer be the danger of the vicious circle of action and reaction and medicine will progress rapidly without having to face the hidden dangers on its way.
14. Mixing medicine with politics has always created many difficulties in the social world. Politics has repeatedly made medicine its tool and finding it helpless and unbacked has always tried to dominate it. Future medicine which will be based on ethics, will have a different relationship with politics from that of the present, whatever form it

may take. If medicine will not be able to free itself completely from political influence, its association with politics will, at least, be that of a free and independent partner.

15. It is not our object merely to include ethics in medicine. It is already there in some form or other. But what is aimed at is to give it a fundamental status and to raise medicine on this foundation. For this purpose the standard of education, syllabus, and the atmosphere on medical education shall have to be made 'ethical'. Nor should 'ethical medicine' remain as a mark of the individual heroism of a single person or of a set of persons and end with them. On the other hand, just as we expect that the students turned out by our medical schools will be conversant with surgery and therapeutics, so should we expect that they will also be 'ethical'.
16. So far as Pakistan is concerned, its immense medical problems cannot be solved without "Ethical Medicine". This is the only right, effective, and durable way to reform the physicians of this country. Otherwise the hospitals and dispensaries of this country will fast turn into shambles. And this is also the solution of the problem of rural medical relief in Pakistan.

If we succeed in realizing 'Ethical Medicine' in its true significance, it will be such a great achievement in the social world that all previous social achievements will pale before its universality and extensiveness. There is no alternative for Medicine except 'Ethical Medicine'!

Ethics in Traditional Medicine

There is nothing new or unique about medical ethics. It is as old as human civilization itself. The code of medical· ethics existed even during the time of the Babylonians, some 3500 years ago. The modern code of medical ethics was, however, laid down by the Father of Physicians, Hippocrates, 2500 years ago, which holds good even today. It is the distinctive mark of medical ethics which determines a physician's place in society and gives the highest position to his profession.

There is no parallel to the Hippocratic Oath in history. The Oath has endured through the centuries. All physicians, particularly practitioners of Tibb, accept its spirit and intentions as their ideal standard of professional behaviour.

While the basic principles of ethical conduct of the physicians remain unaltered, they have varied in detail through the ages, according to the peculiar needs of the time and place. In every country an attempt has been made to codify the standard of conduct expected of the physician in the practice of his profession.

The practitioners of Tibb have been guided in their professional conduct by the principles laid down by the great masters like Ibn Abbas Majusi, Abu Sahl Masihi, Prince of Physicians – Bu Ali Sina, Al-Biruni and Hakim Azam Khan. Above all, the ethical code of *Tibb-e-Nabavi* has been a beacon of light, a source of strength and inspiration to them.

According to *Tibb-e-Nabavi* and the great savants of Tibb, a physician must be learned and intelligent and must strictly follow the *Shari'ah.* He should also never go back on his promises, and must have great sympathy and compassion for the patients. His diagnosis should be correct and he should never fight shy of speaking the truth.

Anybody who has bad manners and is a confirmed criminal is not fit to be a physician. The essential prerequisites of the noble profession are gentlemanliness and purity of thought. He should not tell the patient directly about the nature and seriousness of his disease but should convey the information to his relatives or friends. He should respect his teacher as his own father and treat the pupil as his own son and should show prime concern for their welfare and progress.

Besides knowing the art of medicine, a physician should also be deeply religious and must have sympathy and understanding even for animals. He should never stoop down to backbiting and see and hear no evil. He should be hospitable and economical and must eschew ostentation and luxury, pomp and show, fun and frolic.

A physician should have complete grip on the problems of the patient and should not be greedy. He should in no case wish ill to the patient. He must have travelled widely to acquire knowledge and gained considerable experience. His interest in Tibb should be deep and abiding and should give patient hearing to the patient.

If there is any unintentional lapse, he should immediately pay attention towards its remedy. When he visits a patient, he should give his findings about the ailment after examining the case carefully to the patient's attendants and must console the patient and utter such words before him which may inspire hope and confidence. If he cannot visit the patient frequently, then he must entrust the case to a physician who lives in his neighbourhood and in whose hands he feels him secure.

He should not interfere with the treatment of any patient who is under the professional care of another physician. If he is called to examine such a patient, he must in advance call the attending physician as well. This will enable him to know the history of the case and will also facilitate the treatment with mutual consultation.

A physician should never pick holes in the treatment given by another physician nor should he try to defame him by pointing out his errors. If he sees something wrong, he should call the physician and bring the point home to him.

A physician should be well conversed in all branches of medicine. Besides knowing the basic principles of Tibb he should also have an insight into its various details. A physician should also have studied logic, philosophy, *Kalam,* psychology and music. He should not only know the composition and propriety of medicines but should be fully aware of the changes that occur in their action and effect after mixing two or three or more medicines.

If a physician happens to examine such a patient, the like of whom he has never seen before nor can he find any description of such patients in medical books, then he should give serious thought to the symptoms and history of the case and start his basic treatment. Thus he will ultimately be able to diagnose the disease and cure it.

A physician's relations with the brethren in profession should be cordial. If any physician needs his assistance in the field of medical knowledge, he should extend it without any hesitation.

If a physician comes to him as a patient, he should not charge any fee from him and if possible, he should also provide other necessary material help to such deserving cases.

A physician should take utmost care in attending to pregnancy cases. He should agree to induction of abortion only when he is convinced that in case it is not done, the mother and the child will die or they will suffer from such fatal diseases as tuberculosis, cholera etc. He should never carry out an unlawful abortion. He must act with great care and caution while inducting abortion. Abortion without any genuine reason is not only a sin but is also a crime in the eyes of the Government.

The physician should also be very cautious while cutting human body or limbs. If he does not have an expert knowledge of a certain branch of medicine, he should not use that branch of knowledge for treating patients. This will bring a bad name to him.

While examining a patient the physician should seek light from God and after prescribing the medicines according to his knowledge, he should pray to the Almighty that He may in His infinite mercy cure the' patient.

This is in brief the standard of conduct expected of a practitioner of Tibb. For more than a thousand years, the *Tabibs* have been largely following these principles in their professional conduct. It needs no stress that the above-mentioned code of ethics includes all the best in moral values and is much more comprehensive than the "Hippocratic Oath" or "Declaration of Geneva".