Opinion

Sense and Nonsense in the Practice of Medicine
A Critique of Traditional Iranian Medicine

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Introduction

Since ancient times, science has gone through several revolutions. The Aristotelian mechanics gave way to Galilean and Newtonian mechanics which were in turn replaced by Einstein's relativity. The Ptolemic system of geocentric astronomy was totally replaced by the heliocentric system of Copernicus and from Galileo's crude telescopic observations of the planets, modern telescopes can see billions of galaxies each containing billions of stars. From Robert Hook's microscope, 350 years ago, to today's electron microscopes, we have become aware of the world of small biological structures unimagined prior to the invention of these instruments.

In the last four or five centuries, science and technology have increased our knowledge of the world beyond the imagination of those prior to these scientific discoveries. No educated and intelligent person today would see the world in the same way as our predecessors did a few hundred years before the advent of these scientific advances. We are fortunate that the practice of medicine has also benefitted from these scientific and technological advancements.

The anatomy of the vascular, lymphatic and the nervous system are known in much more detail than at the time of Galen or Razi. With the aid of the microscope we can visualize the fine structure of the cells within the organs and tissues and advances in physiology and biochemistry have helped us to comprehend the functions of the internal organs, as well as those of muscles, skin and the nervous system.

Although we have advanced a great deal in our understanding of organisms and the function of their systems, there is still much to be discovered. Therein lies the beauty of science where each advancement opens channels for further novel discoveries and improvement of our knowledge.

Science has given us a logical system of enquiry and evaluation of form and function rather than accepting as unadulterated truth the mythical pronouncements of ancient sages. In science, there is no recourse to authority except demonstrable facts which can themselves be superseded by superior and more accurate facts.

In this essay, I shall attempt to compare and contrast scientific, evidence-based medicine with what is known as Traditional Iranian Medicine [TIM].

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Traditional Medicine

"The illiterate and common people believe that whoever calls himself a 'doctor' will be able to cure all illnesses and alleviate any pain" Mohammad Zakariya Razi.[1]

'Traditional medicine', as part of a worldwide resurgence of interest in 'alternative medicine', has gained prominence in recent decades. This is partly due to the fact that certain illnesses, such as chronic pains, certain cancers or congenital diseases cannot yet be cured by modern medical treatments and so people with such afflictions grasp at the straws that alternative medicine may offer, but so far, there is no real evidence that their suffering has been mitigated by such means.

In the last three decades, throughout Europe and North America, many universities started departments of Complementary and Alternative Medicine [CAM] wherein students can obtain a Bachelor of Science (B.Sc.) degree through a four-year curriculum. Within the last two years, all publically funded universities in the UK have closed their CAM departments, although private institutions throughout Europe still continue to offer such degrees. In North America, no reputable university teaches such courses but many lesser known universities and private institutions continue to do so.[2]

In 1999, the US National Institute of Health (NIH) in Bethesda, Maryland, established a National Center for Complementary and Alternative Medicine [NCCAM] to evaluate the efficacy and safety of CAM practices and therapeutic products. The Center has funded more than 2,500 research projects only to find marginal benefits from acupuncture or spinal manipulations, comparable to modern therapies for pain, while finding significant hazards in the use of some herbal remedies including *Ephedra, Kava, and St.John's wort* as well as the fact that many Ayurvedic medicinal products contained significant levels of lead, mercury and arsenic.[3]

Traditional Iranian Medicine

After the establishment of the Islamic Republic of Iran three decades ago, there appeared movements to promote the practice of Islamic Medicine within Iran. Islamic medicine comprises the writings and the practice of prominent physicians who lived and wrote in the Islamic Empire, the most eminent of whom include Ali ibn Rabban Tabari (838–870 C.E.), Zakariya Razi (865–925 C.E.), Ali ibn Abbas Majusi Ahwazi (died 982 or 994 C.E.), known in the Europe as Haly Abbas and Abu Ali Sina, famed in the West as Avicenna (c. 980-1037 CE.), although some of them

were Iranian Jewish, Zoroastrians or Christians.

Furthermore, much of what they wrote was adapted from ancient Greek physicians such as Hippocrates (460–377 B.C.E.) and Galen (129–200 C.E.), although they added many significant improvements and amendments to the Greek medical practice.

The Tehran University Medical Department established a school of Traditional Iranian Medicine in 2007, offering doctoral degrees in this discipline.

The main textbook of this course is titled 'Medical Sciences in the Culture and Civilization of Islam and Iran' which is a fine exposition of the history of Iranian traditional medicine including the many advances made by various Iranian physicians in the theory and practice of medicine from the 9th to the 15th centuries.[4]

To write about and teach the history of Traditional Iranian Medicine as part of our heritage is commendable, but to teach it as a practical science and recommend its theories, methods and practices to replace or even to supplement modern scientific medicine is tragic and retrogressive.

The Structure of Traditional Iranian Medicine

Traditional Iranian Medicine is divided into two main branches; a theoretical and a practical branch.[5]

In this brief essay, I can only refer to some examples of these branches to illustrate the folly of the program known as TIM.

Theory

Anatomy

As an example in anatomy, a brief history of the theories regarding the circulation of blood is described here.

Apart from the Hippocratic and Aristotelian belief that the arteries and veins contained 'pneuma' or air, Galen (129–200 CE.) described bright blood contained by the arteries that was produced in the heart and darker blood that was produced in the liver and carried by the veins. His belief was that both these types of blood were carried to the periphery and consumed by the tissues and the heart and liver produced more blood *de novo* for the next pulsation. Six hundred years later, Zakariya Razi (865–925 C.E.) and Majusi Ahwazi (10th century C.E.) had made minor advances in the anatomy of the heart but it was not until 250 years later that Ibn Nafis Damashqi (1210–1285 CE.) discovered and described the pulmonary circulation. Five hundred years after Ibn Nafis, the English physician William Harvey (1578–1657 C.E.) discovered that the same blood circulates throughout the vascular system, pumped by the heart and the final link in the chain of circulation was demonstrated by Marcello Malpighi in 1661 CE when he discovered the microscopic capillaries that connect the arterioles to the venules.[6]

It took nearly 2000 years to accomplish an understanding of the concept of the circulation of the blood, and this knowledge had to await the development of finer dissection techniques, the mechanical concept of a pump, and the invention of the microscope to arrive at an explanation of the system of the circulation of blood. Any physician today who wishes to ignore this simplest of mechanical and anatomical explanation of the circulation of blood and clings to the concepts of Galen or Razi on this subject probably prefers phantasy to fact.

In order to avoid any misunderstanding, I must hasten to add that I consider Zakariya Razi as one of the most advanced thinkers of his time, both in his logical and empirical methodologies, and in my opinion he was a true scientist in its modern connotation and even superior to many who followed him in the succeeding centuries, including Abu Ali Sina.[7]

At this juncture, I feel compelled to quote Razi from his book 'Doubts about Galen' (Kitab Al-Shukuk Ala Jalinus), but I will return to this matter later in this essay.

"During the passage of time, scientific knowledge increases and approaches perfection, and what a scientist in the past laboured for a long time to discover, a future scientist will understand quicker……especially if a later scientist manages to improve on the ideas of his predecessors."[8]

In order not to be labour the anatomical advances, such as neuroanatomy with its microscopic details and immunohistochemical staining and functional connections suffice it to say that if Galen or Razi or Ibn Sina were alive today, they would have been amazed and delighted to see such progress, but any physician today who denies the reality of such advances, must remain in the darkest of ignorance (*Jahl-e Morakkab:* compound ignorance) forevermore.

Physiology

The physiology of Traditional Iranian Medicine is based on the following seven factors:

i. Elements (*Arkan*)
ii. Temperaments (*Mezaj*)
iii. Humours (*Akhlat*)
iv. Organs (*A'za*)
v. Spirits (*Arwah*)
vi. Faculties or Forces (*Quwa*)
vii. Functions (*Af'al*)

These factors will not be described in detail but it must be mentioned at this point that at least the first three are purely Greek, adapted from Aristotle, Hippocrates and Galen which gradually entered the Iranian medical literature during the Sassanid dynasty, probably in Gundeshapour, but have no prior Iranian origin.

The oldest extant Zoroastrian text of Avesta, including Gâthâs, Yasnaha, Yashtha and Vendidad, which probably date from 1200 B.C.E. up to 140 B.C.E., contemporary to the Achaemenids and the Parthians (Arsacids), make no mention of such concepts in their medical literature except the religious significance of maintaining the purity of water, earth, fire and the air. Despite the fact that there were Greek physicians such as Cetsias and Democede in the Achaemenid court, there is no evidence that Greek medical theory entered the Zoroastrian or Magi medical practice or theory at that time.

It is only in later Zoroastrian writings (middle Farsi) such as Dinkert, Minooye Kherad, Zâdspram and Bundahishn, which date from the 7th to the 9th centuries C.E., after the dissolution of the Sassanid Empire (651 C.E.) that these concepts appear in Zoroastrian texts.[9] It may be true that these texts reflect the medical theories of the Sassanid era, when Greek, Indian and Syriac medical practices were common in Iran, but no primary sources of the Sassanid era are extant today to attest to this premise.

The presumption that these concepts of Temperaments and Humours were originally Iranian and were subsequently transmitted to the Greeks[5] seems unfounded despite Cyril Elgood's unsubstantiated assumptions.[10]

And so it seems that these early Greek concepts were incorporated into the Galenic medical theories to describe the complexities of diseases for which no better explanations were available at the

time. Subsequently, Iranian physicians accepted and developed these concepts to form the physiological tenets of medical practice, which were later translated from Arabic into Latin during the middle ages and formed the foundations of medicine in medieval Europe.

It was not until the late Renaissance and the Age of Enlightenment in Europe (16th–18th centuries C.E.) that sciences, including medicine, began to develop into a coherent and logical system based on new observational data.

The basic premise on which the edifice of Galenic physiology was constructed entails the four indivisible *Elements* of Aristotle: Air, Water, Fire and Earth of which the world was thought to be composed. Each element possessed a combination of two of the following properties; Wetness, Dryness, Heat and coldness. If one questions the veracity of these *elements* and their attributes then the whole of Galenic physiology and medicine consequently collapses.

In ancient times, the pronouncements of the Masters or Sages were considered as gospel truth and any doubt cast upon these pronouncements was tantamount to heresy. Zakariya Razi was perhaps the first thinking physician to doubt some of Galen's statements in his "Shukuk ala Jalinus", but I shall discuss this subject later in this essay.

It was later through the gradual work of chemists that the true elements of which the real world is composed were discovered, culminating in the work of Mendeleyev, and more recently in the theories of particle physics.

Once a theory is based on incorrect assumptions, newer, more accurate observations which do not quite fit in the original theory give rise to problems of explanation and accommodation. This is when, according to Thomas Kuhn, the accumulation of anomalies causes a breakdown of dogma and necessitates a paradigm shift and a revolution in that scientific field.[11]

In the medical sciences, this revolution started in the 17th and 18th century Europe, culminating in the field of modern scientific medicine, which continues to discover more revealing facts regarding the working of the human body as well as those of other living organisms.

In order to illustrate this process of paradigm shift, I will turn to astronomy for an example.

In the 2nd century C.E., Ptolemy of Alexandria, compiled his treatise, The Almagest, based on a geocentric principle, where the Earth was assumed to be stationary at the centre of the universe with the Moon, the Sun and the five then-known planets orbiting the Earth in perfect circular motions. According to Plato, circular motion was the most perfect motion possible and as these planets revolving around the Earth were heavenly bodies, therefore it was necessary for their motion to be circular. This theory, which was successful for many centuries to predict various astronomical phenomena including solar eclipses and occultation of the planets, gradually failed to explain some of the observed motion of the planets which sometimes seemed to move backwards (retrogressions) and then came back to resume their circular motion. This gave rise to a very complicated system of epicycles for the motion of the planets in order to fit observation with theory. This system of belief, with minor modifications, persisted for about 1,300 years until the time of Copernicus in the mid-16th century C.E., when his book 'On the Revolution of Heavenly Spheres' was published while he was on his death bed. The Copernican system was based on a heliocentric assumption, such that the Sun was stationary and the Earth and the other planets rotated around the Sun. This was a major conceptual change, although Copernicus still maintained the circular orbits and the epicycles. There remained for Tycho de Brahe to make more accurate astronomical observations, and Kepler to formulate the elliptical motion of the planets, and Galileo to describe his telescopic observations and for Newton's theory of gravitational forces to finally establish the heliocentric system of celestial mechanics and lay to rest the erroneous assumptions of the Ptolemic theories. This process took several hundred years; but in the last two centuries, the rapid pace of science and technology since the industrial revolution has totally changed our world views and theories regarding the realities governing the external world.

This example was chosen to illustrate how through the passage of time and the efforts of several great thinkers, an ancient theory can be replaced by a totally new concept which describes the real world better than its predecessor and also to emphasize that in the future, we can expect that more refined experimental observations and theories to add to our knowledge.

To disregard the advances in physiology and biochemistry such as the measurement of blood pressure in units without having to guess from the strength of the pulse, the amount of sugar in the blood or urine without having to taste the patient's urine, the visualisation of blood corpuscles and understanding of their functions, the role of enzymes and hormones in the maintenance of health and their role in diseases, genetic concepts and orchestration of development and so many other advances; to disregard all these and to hold fast to the demonstrably erroneous beliefs in *elements and humours* of two thousand years ago seem grossly anachronistic.

It would seem redundant and futile to belabour the rationalistic and experimentally demonstrable advances made in scientific physiology in the past few decades that contradict the Galenic beliefs in humours and temperaments, when any reasonable person with a modicum of intelligence and knowledge may see the folly in the persistent belief in the *epicycles* of human *temperaments.*

Practice

The practical branch of Traditional Iranian Medicine include; Preventative Medicine, Surgical Treatments and Herbal Remedies.

Preventative medicine

Preventative Medicine is perhaps the truly Iranian concept which dates back to Zoroastrian teachings and even precedes Zoroaster by several centuries in the beliefs of Aryan tribes, who migrated southwards from central Asia east and west of the Caspian Sea, to settle in Northern India and the Iranian plateau as well as migrating and populating the European continent over several centuries of migrations.

As mentioned earlier, the oldest Avestan texts attest to the Iranian beliefs of maintaining the purity of running water and the freshness of the surrounding air as well as personal cleanliness and that of their living quarters which were held sacred for the promotion of health and prevention of disease. These concepts, together with the nutritional benefits of a healthy diet and exercise are probably truly Iranian and may have influenced other cultures including the Greeks who were not known for their personal hygiene. If Traditional Iranian Medicine has any constructive contributions to make, it is certainly in the field of personal and environmental hy-

giene, including preventing the abandon with which our citizens litter the land, rivers and streets. Any effort and money spent on the promotion of these concepts would be immensely beneficial to Iranian citizens who have become careless in these matters.

Surgery

Surgery, in one form or another, has been practiced since prehistoric times, and evidence of skull trephination, whether to release 'evil spirits' or reduce the fluid of hydrocephalus, is abundant in archaeological literature including in the "Burnt City" in south-eastern Iran.

Opening of abscesses or removal of superficial tumours, treatment of broken bones and wounds, inflicted during wars or hunting of ferocious animals, has been a universal practice throughout the past several thousand years and has been common to all civilisations. There is no surgical technique that is peculiar to Traditional Iranian Medicine.

The opening of veins for bloodletting, cupping with (*Hejaamat*) or without cutting to release or filter tainted blood has been an ancient method of treatment since Hippocratic and Galenic times. One of the logical fallacies evident in a passage in the 'Cannon' of Ibn Sina regarding cupping and cutting reveals a misconception, current at that time, with respect to the influence of the Moon on the tides of the oceans. Since the time of Ptolemy in the 2nd century C.E. and probably even before then, it was observed that the rise of oceanic and river tides was related to the position of the Moon and therefore it was surmised that the full Moon caused the rising of these waters, although the gravitational force of the Moon was not known until the time of Newton and his formulation of the force of gravity in the 17th century C.E.

The fallacy lies in the fact that in many places on Earth there are usually two high and two low tides each day as the Moon rotates around the Earth in an approximately 24 hour cycle. The phases of the Moon are related to the relative position of the Earth, the Moon and the Sun and the sunlight that is reflected to the Earth by the Moon from the Sun. The fullness of the Moon or any of its phases have no relationship to the gravitational effect that the Moon has on the Earth's oceanic tides and it is only the simple-minded who assume that the full Moon is *bigger* and therefore exerts a greater attractive force on fluids on Earth.

Ibn Sina, or at least his translator (Sharafkandi), have fallen into this trap, as in the chapter on *Hejaamat* (cupping or cutting),[12] Ibn Sina recommends the beneficial effects of this procedure during the full phase of the Moon, and Sharafkandi in his notes at the bottom of the page explains the beneficial effect due to the increased *gravitational* effect of the full Moon.

One of the great misfortunes of scholarship in Iran is its absence. Although Ibn Sina's 'The Cannon of Medicine' was translated into Latin in the 15th Century C.E., yet there was no Farsi translation until the early 20th Century by Abdul Rahman Sharafkandi and there have been no further commentaries or analysis on that translation since. A greater tragedy is that the 'Havi' of Zakariya Razi still remains untranslated into Farsi except two volumes translated by the Iranian Academy of Medical Sciences on simple drugs.

Herbal Medicines

Herbal remedies are as old as the history of humanity, and various herbs, individually or in combination with other herbs and minerals, have been recommended for their therapeutic effects in maintenance of health or treatment of disease since prehistoric times. The Shamans of central Asia and their Magi descendants in Aryan lands, the Medicine Men of North American Natives, the Witch Doctors of Africa, as well as the Chinese and Indian herbalists were familiar with the therapeutic effects of certain herbs, through long traditions of empirical practice and those herbs were later incorporated in traditional as well as modern pharmacopoeias. There is nothing truly Iranian with regard to these herbal medicines.

Zakariya Razi, in his last two books of Havi, describes the remedial properties of herbs and goes into lengthy detail of the recommendations of physicians prior to himself and then adds his own commentaries and observations on their beneficial or adverse effects.[13]

Ibn Sina, unlike Razi, lists the therapeutic effects of medicinal herbs almost verbatim from the Galenic and other compendia without any further commentaries. It is noteworthy that on his journey to Hamadan, Ibn Sina developed severe abdominal colic (*Gholanj*) and despite the administration of his own recommended medications by his pupil and constant companion, Jozjani, he died en route to his destination in 1032 C.E. at the age of 58.

Modern pharmacopoeias are greatly indebted to the remedial effects of ancient herbal medications; nevertheless, there are certain caveats which distinguish between the beneficial effects of these herbs and the side effects related to their overdose.

In the context of the recent resurgent fashion in alternative and traditional medicine, it is often stressed that because these herbs are 'Natural', that is they are not chemically manufactured products, they must be safe to consume. This is a *totally* mistaken assumption, as the most toxic poisons known to man are derivatives of plants rather than the venoms of a few animals such as snakes and scorpions.

Even the most innocuous and popular foodstuffs can have disastrous and even fatal consequences if taken in excess.

It is true that modern pharmaceutical medications are not free of side effects or serious complications, but at least there are governing bodies, including the American FDA, exercising checks and balances to assess the side effects of new medications compared with their therapeutic benefits. Complicated and costly clinical trials are designed to evaluate the beneficial effects of new medications, as compared to placebos, in double-blinded and large multicentre studies, even though these trials are not necessarily perfect. If Traditional Herbal Medications are to be prescribed for therapeutic purposes, they must be evaluated with similar rigour. It is unfortunate that they are advertised as food supplements rather than medication, by which ruse they can bypass the FDA evaluation and corner a multibillion dollar market.

A further misconception is that these ancient remedies were miraculously effective treatments and if only they could be resurrected from the practices of ancient sages, the afflictions of modern day patients can be cured more effectively than with modern medications and perhaps more cheaply.

This myopic view ignores the historical facts that in the past several centuries, thousands perished from outbreaks of cholera, various plagues including the Bubonic 'Plague of Justinian' in the 6th–7th centuries C.E. when about half the population of Constantinople and Europe died and also the 'Black Death' which claimed an estimated 70 million to 200 million lives in 14th century Europe.

In recent centuries in Iran, Typhus, Cholera, Tuberculosis and

Smallpox devastated rural populations and diseases like Polio and Trachoma left many maimed. Most of these diseases have been eradicated by immunisation to prevent and with antibiotics to cure. Infant and maternal mortality has been dramatically reduced with modern medical interventions. None of these methods were known to traditional practitioners, nor were their treatments in any way effective.

Even though Zakariya Razi could diagnose and distinguish between Smallpox and Chickenpox, he had no effective treatment for either.

It would be interesting to know how TIM proposes to allay the devastations caused by such morbid and mortal conditions.

In the practice of any form of medicine, there are several important concepts which must be taken into account in order to evaluate the objectivity and the honesty of that practice. One of the most important and recently verified concepts is the placebo effect.[14] It is outside the scope of this essay to detail the advances made in the degree of its influence and the psychological mechanisms of its action, which are still not known in any detail, but suffice it to say that humans are suggestible, and if they believe in the therapeutic intentions of their physician and his medication, then for certain subjective ailments, a placebo can be effective to some extent. It is for this reason that a newly proposed medication must be shown to have superior effectiveness compared to placebo in clinical trials, and in more rigorous trials, they must be shown to be more effective than existing treatments. If under such circumstances, Traditional Iranian Herbal medicines are ever shown to be successful, they must be accepted as bona fide treatments, but not otherwise.

Summary

In this essay, I have attempted to give a brief account of some of the advances made in modern scientific medicine since the 17th century C.E. and to compare these advances with the beliefs and practices of Traditional Medicine from Hippocrates (2,400 years ago), through Galen (1,800 years ago) and Razi and Abu Ali Sina (1000 years ago). I have tried to demonstrate how irrational and retrogressive it must be to maintain and practice the medical teachings of physicians of so long ago despite the demonstrable advantages of progressive science and technology in the intervening centuries. The practitioners of Traditional Medicine are only too happy to take advantage of the cornucopia that has been the result of these modern technological advances in so many fields, yet doggedly adhere to irrational beliefs and practices of physicians of several millennia ago. The motivation for the maintenance of such an ideology seems to me beyond reason.

The two main pillars of Traditional Iranian Medicine rest on the teachings of Zakariya Razi and Abu Ali Sina.

Earlier in this essay, I promised to return to the teachings of Razi, whom I consider as one of the most open-minded physicians and philosophers, not only of his time, but for many generations that followed, until the extinction of rationalism and science in the Islamic world. To mention his seminal achievements in chemistry or philosophy is not relevant to this essay, but his thoughts in the practice of medicine are definitely appropriate. The theme of Razi's teachings that I wish to emphasize is his questioning of the writings of his eminent predecessors and thus, I wish to quote two further passages from the introduction of his book, 'Doubts about Galen' (*Kitab Al- Shukuk Ala Jalinus*):

"Everyone is aware of the authority and the status of Galen in medical matters and thus some less gifted individuals have been outraged by my criticism of him, but the wise and the sage shall not think less of me for they know that in science and philosophy, imitation is not wisdom but that reason and logic must guide one's thoughts and if Galen were alive today, he would praise me for this writing." And later in the same introduction he writes, "… In medicine and philosophy, blind obedience and surrender to authority is unacceptable and Galen himself had chastised those who attempted to impose their opinions on their students without reason or logic."[8]

And finally, there is the caveat that unless we become initiators of knowledge, rather than imitators of Western knowledge, then we are doomed to a third rate status in the advancing world of science. The rhetoric of scientific advancement in present day Iran, whether in medicine, genetic engineering or nuclear physics, will remain just that – only rhetoric. It is time to wake up from the slumber of self-delusion, TIM notwithstanding.

Alas, the road to science and scientific medicine is an arduous one and cannot be travelled overnight, nor established through edicts issued by authorities on high.

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