

Food Today

with Pat Bennett, "Turning Stones into Bread: Developing Synergistic Science/Religion Approaches to the World Food Crisis"; Varadaraja V. Raman, "Food: Its Many Aspects in Science, Religion, and Culture"; A. Whitney Sanford, "Why We Need Religion to Solve the World Food Crisis"; and Steven M. Finn, "Valuing Our Food: Minimizing Waste and Optimizing Resources."

FOOD: ITS MANY ASPECTS IN SCIENCE, RELIGION, AND CULTURE

by *Varadaraja V. Raman*

Abstract. Food is a *sine qua non* for life on Earth. It has more significance than nutrition and sustenance, more variety than many aspects of human culture. Food has religious as well as historical dimensions. The complexity of the food chain and of the related ecological balance is one of the wonders of the biological world. In the human context, food has found countless expressions and regional richness. Food has provoked feasts, as its lack and maldistribution have caused famines. While being a source of physical satisfaction food has also had environmental impacts. Some of these matters are explored in these reflections.

Keywords: food; history; religious practice

SIGNIFICANCE OF FOOD

Mother Nature who art on Earth
Hallowed be thy ground.
May thy farms and fields flourish,
With fruits and grains that by all are found.
Give us each day our daily food
To us and to one and all.
Let's work for the common good,
Let that be your clarion call.

Let's not drift into selfishness
Feeding ourselves alone
When others elsewhere are hungry,
With nothing to call their own.

Varadaraja V. Raman is Professor (Emeritus) of Physics and Humanities, Rochester Institute of Technology, Rochester, NY 14623, USA; e-mail: vvrsp@rit.edu.

May we share the food we have,
 For this we collectively pray:
 May none suffer from starvation,
 May all have food each day.

We are creatures in a vast universe of countless galaxies and stars, on a planet in our solar system. We are here on Earth at an insignificant spot in the fringe of the Milky Way. In the language of religion and the metaphor of poetry, we are blessed with body and spirit to experience the world.

The spirit generates thoughts, lofty and trivial, serious and light-hearted. It enjoys and suffers, conceptualizes and calculates. It is encased in a physical body. The body responds to light, reacts to sound and smell, feels touch and relishes taste. It is sustained by interconnected factors in the environment: light and warmth from the distant sun, an airy mantle that fuels our lungs, and water to quench thirst, cleanse bodies, and cools us when surroundings are hot.

Food is an enjoyable necessity of life. The beauty is admired, music is heard, the fragrance of flowers is within our olfactory reach, and food is tasted. What is seen, heard, or smelled is not affected, nor diminished by our experiencing it. Food when consumed is reduced at the source.

One can live for days and months without seeing a Raphael or a Rembrandt, without listening to Tchaikovsky or Tyagaraja, without smelling lilies and jasmines. But food is an everyday need, a *sine qua non* for living. There are delightful sights, smells, and sounds in Nature. All these are readily available. For food, however, we need to labor, to sow seeds and water the fields. We are dependent on rain for seeds to sprout. We rely on uncertain sources for harvest.

Food is the gateway for the full experience of life. The finest expressions of the human spirit emerge only from bodies that function well. Poor artists may have painted masterpieces, but there are not too many starving composers of music or playwrights.

Food is seen in fields of wheat and corn, in vegetable gardens, orchards and vineyards. We see foods in grocery stores, in cans and bottles. They become part of us only when we eat them. Eating transforms inert matter into experienced delight. Only what is edible is food, just as only what can be understood constitutes knowledge.

As a bonus to eating, there is taste which adds to the glory of this dire essential. But for taste, eating would be as demanding as exercise to keep the body fit. We are grateful for the food we get; we must be equally thankful for taste buds.

As with all creatures the first concern of *Homo sapiens* for survival was food. In the distant past human beings consumed practically everything they could lay their hands on: earthworms, frogs, lice, and spiders, to name but a few. Gradually, human beings developed the ability to obtain

more massive flesh, like that of elephant and reindeer, buffalo and camel. Instinctively they kept away from wild animals (Heiser 1900).

Hunting had some unexpected consequences on *Homo erectus*. Most wild animals use brute force on their victims. Their piercing claws and sharp teeth rip open the bowels of the prey. With humans, the would-be prey was thick-skinned and wild, stronger and more massive than the hunter. Not all animals are as easily snared as frog and fish. So humans had to devise other means to subdue their game. They did this with sharp stones and pointed sticks to begin with. In other words, humans began to use the resources of the world to exploit Nature for their needs, and to explore new ways to augment their intrinsic strengths and capabilities. Our ancestors became tool-makers. Thus was born technology. Its initial aim was to kill in order to feed (Bronowski 1973).

Even with tools and techniques, it was not always easy to capture the swift deer or the massive elephant. This could only be done by careful scheming, clever strategy, and coordinated action. That meant collaboration between individuals and called for communication through grunts and groans. Thus hunting provoked humans to act in concert, to share thoughts and plans through symbolic sounds. Victorious captures led to collective jubilation. Social cohesion arose. Efforts to combine forces also led to better communication: the transfer of thoughts and ideas. Thus language emerged in human groups.

Not only material tools, but also the enriching instrument of language and the spiritual dimension of shared life emerged from hunting. The foundations of technology and of culture were laid by attempts to satisfy hunger, the urge to have more than what is available, and the ingenuity to exploit the resources that abound in Nature. Food played a significant role in cultural evolution.

Then there was the agricultural revolution which eventually led to settlements and cities (Diamond 1997). Unlike political revolutions, this was not born of the mind, nor stirred by ideas and ideals. It came about by the accident of discovery, Nature thrusting upon humans the possibility of food from land on a regular basis. It is the only revolution that did not call for the spilling of blood. Gradually, human ingenuity began to take even greater advantage of the environment.

Efforts to satisfy desires have been the mainspring of human activity. The New World was "discovered" in the quest for a shorter route to get spices from the Indies. Without a craving for cumin and pepper there might not have been United States and Canada, San Salvador and Brazil.

The richness of flora and fauna has more significance than their variety and splendor. The totality of plants and animals in any given place forms an interdependent self-sustaining whole: the ecosystem (Vaughan et al. 1997). The channeling of waters through irrigation began to erode the soil, creating eco-imbalances with the ultimate result of turning vast

areas of lush vegetation into arid deserts. Variety was replaced by fewer crops. Complex ecosystems were reduced to simpler ones, more prone to agricultural distress. The difference between ancient and modern times is that in the past people did all this without knowing, now we do this with full knowledge.

People once lived in closed communities, satisfied with what they had, unaware of the insufficiencies of others in the world. Now, details of the contrast are known through magazines and televised news. At one extreme are restaurants where people dine for a few hundred dollars. At the other are anemic children who barely get a meal a day. Awareness of the contrast prompts many to alleviate and correct this inequality. That is what constitutes moral awakening.

Such is the story of food: From berries and beasts to haute cuisine, from when food was only for nourishment to when it is packaged and sealed, traded, transported, and sold.

GRAINS, FRUITS, AND VEGETABLES

The microcosmic level of atoms and electrons is imperceptible to our normal modes of cognition. Then there is macrocosm of sun and planets, stars and galaxies which we observe and admire from here below. Between these is the mesocosm, the level of palpable reality we touch and experience on our scale. The foods we cook and consume are at this level, but their components and processes are at the microcosmic level.

Grains are grass fruits, with an endosperm, a germ, and a bran. Whole grains are rich in proteins, carbohydrates, vitamins, and oils, but cannot be preserved for long. Cereal is a grass. Ancient Romans had named cereals after Ceres, their God of harvest. Pulses are another variety of grains, rich in proteins. They include beans, dry peas, and lentils. We see grains in grocery stores as bread and rice, or in soups (Mauseth 2003).

Some 300 crops provide us with plentiful food. Some two dozen of these dominate the food we eat. Of these again only eight are responsible for 85% of the food we consume. Just three of them provide practically all staple foods: rice, wheat, and corn. More land is dedicated to wheat than to any other grain. In the twentieth century, there was a fivefold increase in wheat production in the world. In the second half of that century, there was a tenfold increase in the annual rate of wheat yield (Bonjean and Angus 2001),

Rice has been cultivated since time immemorial, mainly in India and China. It was introduced elsewhere only in recent centuries. There is an economic aspect of rice which leaves us in a no-win situation. The vast majority of the poor survive on rice. Therefore it is important to reduce its price. But, as of now, rice is produced largely in the poorer countries of the world. This means it would be to the advantage of rice growers if

the price of rice was high. This paradox reminds us that as long as food articles are tied to market fluctuations, economy, and profit, humanity may never be able to solve the food crisis. But it is virtually impossible to change the market structure of the world economy, or the economies of different countries. This implies that there is potential for more starvation, and more debt to be incurred by the nations of the world.

In many Asian countries, rice has also a religious status that few other grains enjoy. In China and Japan, there are rituals associated with the rice crop. In India, feeding the child with a first spoonful of rice is a sacrament. Uncooked rice with turmeric is used in Hindu worship services. Sprinkling rice on newlyweds is a mark of wishing good progeny.

Maize or corn is the third important cereal which was in common use in the Americas before Europeans came to know about it. The Aztecs had a Maize God called Centeotl. From the Americas maize spread to the rest of the world. Maize is one of the genetically modified crops grown commercially. In 2010, 86% of the maize crop in the United States and Canada was genetically modified in order to make them herbicide-tolerant (Bonavia 2013).

Maize is also used for heating in corn stoves where cobs serve as fuel. Ethanol fuel is produced from maize to reduce pollution. Currently 40% of the 330 million tons of corn the United States produces each year is turned into ethanol. When the Aztecs were growing the plant they could never have imagined that someday maize would be used for locomotion.

Barley was one of the first grains to be domesticated. Archaeologists say they have found evidence of its use as early as 8500 BCE. There is a cuneiform clay tablet in the British museum dating back to 2350 BCE in which a Babylonian king prescribed how much barley each of his subjects could consume. Rationing was already in vogue. In ancient Greek rituals of Eleusinian Mysteries a special barley-based drink is said to have been used. Xenophon (2009, 26) wrote: "There were stores within of wheat and barley and vegetables, and wine made from barley in great big bowls; the grains of barley malt lay floating in the beverage up to the lip of the vessel, and reeds lay in them, some longer, some shorter, without joints; when you were thirsty you must take one of these into your mouth, and suck."

The gladiators of Rome are said to have been fed with barley. In fact, they were known as *hordearii* or barley-eaters. For centuries barley was a staple food in many regions of the world. It is used to make beer, whiskey, and also as animal feed. It serves as algacide for protecting pond plants and fish. With eight essential amino acids, Barley is healthy in tea and coffee. The *caffè d'orzo* is only barley-coffee.

The Old World gave us wheat, rice, and barley. The New World has given us not only maize, but also the quinoa, the pseudo-cereal that grows in abundance in Ecuador and Bolivia. Quinoa is rich in nutrients, and can

be cooked like rice. Unlike other grains, it is also used as detergent, and has some medicinal values.

Fruits and vegetables are plant products. The difference is mainly in how they taste. Fruits are usually sweet-tasting; vegetables less so. Squash, pumpkin, and cucumber, tomatoes, peas, green beans, eggplant, and sweet pepper are all vegetables in common parlance, but they are all fruits, technically speaking. Even some spices, like allspice and chilies, are technically fruits. Fruits account for a significant fraction of the world's agricultural products.

The industrial revolution led to radical changes in agriculture. With the emergence of modern agriculture millions of people were released from hard toil in the fields. Agricultural outputs were multiplied, and the quality of the foods produced was much improved.

At the dawn of the twentieth century, there was promise of abundance and satisfaction for everyone. But in the second half of the twentieth century the Eudys Principle kicked in. It states that every good thing introduced in human societies will sooner or later lead to problems, difficulties, and unhappy side effects.

Improvements in agriculture and medicine resulted in population growth and longevity. This meant feeding more mouths for longer periods. More food demanded more water, more mechanization and pesticides. Thus the emergence of modern agriculture led to some ominous circumstances, threatening us with our extinction as a species.

FOOD CHAIN AND FOOD PYRAMID

Nature's way of feeding is wrought with claw and killing, involves pain and bloodshed. Compassionate believers may wonder why God devised a system where merciless mangling and dreaded death are necessities for survival. After all, the Almighty could have created a biosphere where every creature is nourished by sand and stone through protein that Nature synthesizes in water from carbon dioxide and minerals. But this has not happened.

There are food chains in the biological world consisting of creatures that nourish themselves on other creatures that do the same. Food is both passive and active, subject and object, noun and verb. It is not reciprocity but punishment, as it were, killing and karma. You killed that creature for your food because you are stronger, so a stronger one than you will kill you for its food.

A leaping frog that feeds on a flower is itself gobbled up by a snake which serves as food for an owl. In a cool body of water, the bleak fish eats the shrimp, and is itself eaten by the perch which is good food for the pike. The pike is delicious dish for the osprey. Thus we have biters who are themselves bit, gobblers who are themselves gobbled. In some food chains

each creature lives on just one species: they are monophagous. There are also polyphagous food webs which are the cascading quilts of eaters and the eaten (Egerton 2007).

When we picture our blue planet, what comes to the fore are the mantle of air, vast lands and seas, slender streams and surging rivers, rocky mountains and green meadows, deserts and plains, as well as cities, towns and villages. But built into the physical framework of air and water are countless biochemical molecules that form the engine of life. There is also this invisible scaffolding of food chains that is as much part of our green planet as atmosphere and oceans, continents and tectonic plates. At the individual organismic level, each creature is a chemically complex open system that absorbs and eliminates matter and energy, and is subject to a variety of experiences. At the collective level life is an interconnected net of wriggling, throbbing, and feeding organisms of different species.

We need both matter and energy. There is matter aplenty all around us. There is abundant energy splashed by the Sun. One challenge is to trap that energy for vital processes. Even after a billion years of evolution, capturing energy directly from sunlight for this has been achieved only by the green of the world which are at the base of all food chains. These autotrophs turn inorganic matter into organic ones, utilizing the influx of photons from the radiant sun. They have the capacity to turn lifeless carbon dioxide and water into organic molecules, energy-packed glucose that nourish entities endowed with the magic of life. Green grasses are biological solar panels. Without revealing their chemical technology of energy transfer, they feed the heterotrophs that survive only by consuming organic food. Thus, practically all living organisms depend one way or another on autotrophs. No less marvelous are the grass-eating cattle and other mammals which transform grass into proteins and carbohydrates; and feed countless other creatures on earth. As Hamlet in Shakespeare's tragedy puts it: "We fat all creatures else to fat us, and we fat ourselves for maggots" (*Hamlet*, IV, 3, 24–25).

Golden sunlight turns into green grass and leaves and grains. The transformation of solar radiation into salad and sandwich is a miracle indeed.

Whether herbivore or carnivore, parasite or saprophyte, every creature needs food. Here we may envision another blueprint for life: organisms with every experience they currently have without need for food. This could well be an outcome of robotic research: systems that need no food beyond dry-cell batteries for existence.

One of the greatest wonders in Nature is the intricate food web that has been functioning so admirably well this long. This self-sustaining labyrinth feeds billions of organisms. It is among the most sophisticated complexities in a universe replete with routinely functioning complex systems. Its sole purpose is to answer to the hunger of life forms.

The food chain may be a predator chain in which super-creatures feed on subcreatures, somewhat of like a capitalist economy. Or it may be a parasite chain in which smaller organisms subsist on larger ones, sort of like a welfare system. Or again, and certainly the least cruel of all, is the saprophytic chain where microorganisms live on dead matter, not unlike divers who delve the oceans to find lost treasures in sunken ships. Scavengers such as vultures feed on corpses and carcasses, grateful to Zoroastrians who let them feast on their dear departed.

Scavenging is certainly less intrusive on fellow creatures than the systematic slaughter that takes place routinely in the abattoirs of the world where poultry, cattle, and hogs are prepared for the butcher shops and kitchen tables of the world.

Our digestive system can tolerate a variety of foods: we are, evolutionarily speaking, omnivores. The buffet in a restaurant colorfully expresses our capacity and craving for all kinds of foods, from vegetables and fruits to pork and poultry. We are *opportunistic eaters*, capable of eating and digesting whatever food is available. With increasing population we need more than what the land normally yields. So we developed the science of agriculture, animal farming, poultry farming, and fisheries in more sophisticated ways than Nature's food chain. In our industrialized world food production, distribution, and preservation involves fertilizers and fuel-burning tractors, trucks, refrigerators, and more. All these are intrinsic to the human-centered food chain. They make the easy availability of food for those who can afford.

We affect nature's food chain in significant ways. Our predator role, whether through deer hunting or in other ways is part of nature's carnivorous eco-framework. When we inject injurious elements in a food chain, the impact can be disastrous not only for the members within the system, but for others also. The food web involving countless organisms is disrupted in at least two ways: through toxic substances and by removing members in the chain by excessive hunting and fishing. If the body chemistry of a species is adversely affected, that of the creature consuming it is also affected. Chemical pollutants added to the environment eventually enter the bodies of various consumers. Thus vultures are almost extinct in many parts of the world because pesticides entered the bodies of animals on whose carcasses vultures feed.

Our encroachment into the natural food chain is nowhere more dramatic than in our exploitation of the seas. In the ocean microscopic phytoplankton is connected to the zooplankton eaten by small fish, larger fish, and so on up to the giant whale. When chemical industries dump dioxins, heavy metals, and polychlorinated biphenyl into the ocean, these enter the plankton and eventually reach dolphins and many kinds of fish. The PCBs accumulate in the fat of animals. In the case of dolphins they are passed on through mother's milk to the offspring. This led to an alarming death

rate of first-born dolphins in many waters of the world some decades ago (Laws 2000).

In the sea the great white shark is the largest apex predator. Weighing 4,000 pounds and with 300 teeth, each shark is said to consume eleven tons of food each year. Sharks devour vast numbers of sea lions, dolphins, and other sharks which feed on smaller fish. White sharks keep the fish and squid population in balance and available for human needs. Because of overfishing and accidental trapping by nets, the white shark is now an endangered species.

The ocean's food pyramid has also been polluted by sewage and farm fertilizers that create vast amounts of bacteria and algae. Every time a beach is closed, it is because of the chain reaction induced by pollution at the most basic level.

It has been reported that many healthy bees have taken off from their hives and did not return. This is referred to as Colony Collapse Disorder. According to some reports, a third of the bees in the United States have disappeared. Countless fruits and vegetables depend on bees for pollination. The diminution in bees is terrible. The list of vegetation that relies heavily on bees includes almonds, apples, broccoli, cucumber, peanuts, and soybeans.

These are telling reminders that the food web of which we are a part includes creatures that we seldom look upon as related to us. This danger is not unrelated to global warming. The climatic alterations that have been unleashed are bound to affect rainfall and draught, causing uncontrollable floods and scorching drought that will make arable land untillable or sterile. In such situations the regular greens and grains we have been harvesting for thousands of years will come to a halt. No matter how, if the web of food supply is punctured here and there, the end result will spell disaster of catastrophic proportions.

FOOD IN RELIGIOUS TRADITIONS

Human experience is enriched by art, music, literature, philosophy, science, and religion too. But none of these would be possible if the body was not nourished by food. It is, therefore, not surprising that in all religious traditions there are references to food.

One goal of religion is to connect with the Divine, filling the soul of the devout with ecstasy. At the physical level, one of the most universal of such joys derives from eating. From the first suckling of mother's milk to the last gulp before heartbeat ceases, food is the ultimate source of sustenance, and also provider of pleasure: Food is thus the closest to God at the physical level.

Starvation stifles our capacity for love and brings out the worst in human behavior. Continued hunger blinds us to the message of religions. Food is thus an important factor in religion.

Religions beseech the divine for food and express gratitude for the same. Foods have esoteric dimensions. The ancient Greeks had ambrosia, the Romans nectar, and the Hindus *amrita*, immortalizing potions that the gods imbibe. In the Eucharist there is mystical transubstantiation of bread and wine into the flesh and blood of the Savior. In the Hindu world, ordinary food becomes sanctified (*prasād*) by a ritualistic offering to the gods.

There are prayers before and after meal in religious traditions. In the Torah it says: "And thou shalt eat and be satisfied and shalt bless the Lord thy God for the goodly land which he has given thee: The land of wheat and barley, of the vine, the fig and the pomegranate, the land of the olive and of date syrup." A Hindu premeal prayer translates to: "Take the name of the Divine before putting a morsel into your mouth." An Eastern Orthodox Christian prayer is: "O God, bless the food and drink of Thy servants, for holy art Thou, always, now and ever, and unto the ages of ages. Amen." An after-meal prayer in the Islamic tradition is: "Praise to Allah for feeding us, giving us to drink and making us Muslims." A Unitarian grace is: "Loving spirit, be our guest, dine with us and share our bread, that our table might be blessed and our souls be fed."

One of the underlying principles in religions is to resist temptations. Given that food is also a source of physical pleasure, religions remind us not to fall prey to our instinct to indulge in too much food. There is the tenet, explicit or implicit, that it is easier to experience the Divine with a modestly satisfied stomach than with an overloaded belly. The prophets of Judaism, Christianity, Buddhism, Jainism, Islam, Sikhism, as also the rishis of the Hindu tradition, were men of slender frame. With the possible exception of some medieval popes, religious leaders have never been corpulent. The founders of most religions had fasted for prolonged periods.

Yet some religions have had visions of devouring deities. Dionysus of ancient Greece was the god of wine and agriculture. Bacchus was likewise in the Roman world. For the Mesopotamians the god of food and vegetation was Dumuzi. The Japanese called their goddess of food Uke Mochi. In Hinduism there is Annapuruna who is the goddess of harvest and food. Chicomecoatl was the food-Goddess for the Aztecs.

The Vedas refer to food. The sacredness of the cow is articulated there. Here too are the sources for the veneration of milk and the sanctification of food in rituals. The Bhagavad Gita declares that those who offer food to the Divine before themselves eating are relieved of sins. In Sikh Gurudwaras food is always served at the conclusion of worship services.

All religions impose rules on what one is allowed to eat and what one should not even touch or smell. Some anthropologists have discovered that food taboos exist even among more pristine peoples, such as the Papuans in New Guinea, the Orang Asli of Malaysia, and the hunters-gatherers in Paraguayan jungles.

Judaism prescribes *kosher* and proscribes *treyf* food. Leviticus 11:3 spells this out. The Old Testament mentions various birds of prey and certain species of fowl that are forbidden to enter the kitchen. Only fish with both fins and scales are counted as kosher. In Christianity, aside from avoiding fish on Fridays and eating only sparingly during Lent, food restrictions are relatively less strict. In Mark 18 Jesus says essentially that it is acceptable to eat whatever is available; God does not require any restrictions. Islam is closest to Judaism in dietary rules. Here too food is classified as *halal* or lawful food and *haram* or unlawful food. *Halal* meat refers to the flesh of animals that have been slaughtered by invoking the name of Allah. The list of *haram* foods is very much like the one in the Jewish tradition, except that Islam permits the consumption of sea-food, and unlike Judaism, prohibits alcoholic drinks.

Anthropologists and evolutionary biologists have pointed out that there are ecological and medicinal values implicit in food taboos. Often, such taboos have led to more efficient utilization of resources. Food regulations have the cultural effect of giving practitioners a feeling of belonging to a group. Often one feels oneself to be Jew or Christian, Hindu or Muslim or Jain by what one eats and avoids at the dinner table (Simoons 1994).

There are at least two messages in all dietary restrictions. The first is that it is important to be discriminating in what one eats. In the precivilizational state human beings chewed and swallowed whatever they could lay their hands and teeth on. This is natural instinctive behavior. But with the advent of culture, values began to develop in human thought and action. The values included categorizations of good and bad, right and wrong, prescriptions and proscriptions. The ability to distinguish between good and evil, pure and defiled, sacred and the profane, has played an important role in civilization. Imposing rules on what you can and cannot eat fosters self control, enabling us to learn to restrain our basic instincts.

The second thing we learn from food-restriction laws is humane treatment of the creatures that are killed for food. The lion pounces on its prey without the slightest pity for the helpless creature to be mangled and masticated. That animals are there for humans to feed upon is consonant with Nature's food-chain. But as beings with a moral sense we are sensitive to cruelty and touched by compassion. So religions ask us to slaughter with minimal pain.

On this matter, no religion is as respectful of life as Jainism which rests on the principle of noninjury (*ahimsa*) to any living creature. Normally we

care for our family, then for our friends, then for our community, and for our nation. At the most enlightened level people care for humanity at large, for the wellbeing and peace of all. Mahavira, the founder of Jainism, went beyond, and preached that we must care for all living beings, and we must not hurt or kill any creature. Irrespective of whether this is practicable or not, the *ahimsa* principle is a most enlightened principle. It is this idea that inspired vegetarianism in the Jain world.

With all their apparent differences, two elements are common to all religions in the context of food. First, every sacred book prescribes feeding the poor. The second principle is refraining from over indulgence. Obesity, greed, and promiscuity follow naturally from callous self-gratifying behavior.

Religions recognize the human desire for gustatory delights. Outlets for this are in feasts and festivals. Whether in Greece or Rome, in China or India, celebrations at home or in groups for one sacred day or another, there is always an associated feast with an abundance of edibles, often specific to the occasion. Food by any other name would be just as satisfying, if it is tasty, or if one is truly hungry. Food in God's name is spiritually uplifting also.

Humanity expresses itself in different languages and food customs. Everyone must respect the rules of one's own tradition, and no one can claim monopoly over orthopraxis. It says wisely in Romans (14:1): "Accept the one whose faith is weak, without quarreling over disputable matters. One person's faith allows the person to eat anything, but another, whose faith is different, eats only vegetables. The one who eats everything must not treat with contempt the one who does not, and the one who does not eat everything must not judge the one who does, for God has accepted them. Who are you to judge someone else's servant?"

FAST AND FAMINE

As long as we get the food for which we pray and pay, we can handle most of our chores and challenges. But now and again food is not within reach of many people. Absence of food can occur under two conditions: voluntary and involuntary. Fasting is voluntary abstention from food. Most often it is part of religious observance. In the religious framework, any act of giving is a sacrificial act, and fasting brings about an inner transformation for the better. According to a recent report, "Fasting could have protective effects for immune cells such as white blood cells" (Science Recorder 2014).

In the religious context, fasting is done with different purposes: to atone for sinful actions, to ask for forgiveness, to avert severe punishments from a wrathful God, to compensate for a wrongful act. In ancient times, fasting was used sometimes as a protest against authority in India. The practice was

revived in the twentieth century during the British occupation of India. It has spread to many other countries where it is known as the “hunger strike.”

In the Hindu world, many practitioners practice at least once a month, some even once a week. Shivaratri—night dedicated to Lord Shiva—is a fasting night. Yom Kippur is the Day of Atonement when one fasts and introspects. In the Christian framework, fasting enables the Holy Spirit to reveal one’s spiritual condition. Prince Siddhartha—who became the Buddha—fasted for six years, eating barely a grain of rice a day. Toward the end of this period, he realized the wisdom of the middle path between palatial luxury and extreme austerity. We learn from this that food is as essential for spiritual awakening as for physical existence. In Islam fasting is the fourth of the Five Pillars. It is recommended to develop self-control. During this month of Ramadan all adults are expected to fast from sunrise to sunset, except under special circumstances such as travelling, sickness, pregnancy, and the like.

Like all virtues, fasting has its benefits for those who practice it in the appropriate frame of mind. This could be piety in a traditional religious mode, with thought of the less fortunate members of the human family who don’t have the resources to feed themselves well.

In all religious traditions, associated with fasting are injunctions to be humble and charitable to the poor, and be helpful and considerate to all. In some denominations of Christianity, for example, during Lent one is expected to attend Mass daily, including the evening service, pray with the rosary, and undergo penance. Aside from prayers one has also to engage in acts of self-denial, alms-giving, and personal charity. People are encouraged to help in soup kitchens, visit the sick and do other social service of one kind or another. It is worth recalling all these instructions in the context of religious fasting because, whether or not one subscribes to the doctrinal tenets of a religion, one ought to respect the fact that practically all religions preach humanitarian values along with fasting. In such a framework, religious injunctions take on even greater significance. We may note in passing that the founders of Sikhism spoke out explicitly against fasting, and said that what is important is to serve fellow humans, and feed the hungry. In any case, fasting of any kind, religious or not, when combined with social service, is perhaps the highest mode of serving the God one believes or does not believe in.

FAMINES

There are more than 7 billion people on the planet today. Billions more of other life forms from microbes to mammoths also inhabit our planet. Every creature eats every day, be it the tiny bites for insects, nuts for squirrels, fish

for birds, grass for cattle, game animals for beasts, or pizzas for parties: from a morsel to gourmet banquets, our planet has been feeding its bio-hosts day in and day out, since the unrecorded dawn of terrestrial biogenesis.

Now and again, acute food scarcity arises with catastrophic consequences. Famines have occurred all through history. There are theories as to the factors that cause famine. In the view of most experts, political self-interests, ethnic callousness, trading on grains in the futures market, as also ill-considered decisions on the part of politicians, governments, and policy makers are among the causes of famines. In principle, famines can be controlled and responded to (Sen 1982).

A more perennial tragedy than famine is hunger and malnutrition which may not kill the victims right away but which diminish the mental capacity and quality of life of millions. According to a 2010–2012 Report of the United Nations Food and Agricultural Organization (FAO), one out of eight human beings is malnourished in the world. It is some consolation that this number has diminished somewhat in Asia and South America since the previous survey, but the number has not come down in sub-Saharan Africa. Incredibly, right now (2013) one out of six people in the United States suffers from malnutrition. We are living in a truly sad period of history.

What is ironic here is that we are producing more food than we need to feed everyone on the planet. But a sizable percentage of the food produced is either wasted or used to fatten further those who are already overfed, to the detriment of their health. People are hungry, not because there is not enough food in the market, but because there is not enough money in the pocket. Some 1.3 billion poor people in developing countries live on \$1.25 a day or less. It would seem that the solution to hunger is that every human being must have a job with a regular decent income, must have a caretaker, or must be the beneficiary of a substantial inheritance. But then we are drawn into a vicious cycle. Industrialization produces jobs, and that means more environmental degradation. Some have argued that with appropriate modification of the current economic, social, and governmental structures this need not be the case. There are periodic proclamations by the United Nations to eradicate hunger and malnutrition and to prevent famines in the future, but the wish, the will, the competence, and the leadership to achieve this goal seem to be absent.

However, over the past several decades numerous organizations and programs have raised millions of dollars for food aid to undernourished and famine-stricken areas. UNICEF, FAO, mass concerts by celebrity entertainers, and many in affluent countries have been contributing much to alleviate the plight of the malnourished in various parts of the world.

FEASTS AND CELEBRATIONS

Religions also foster enjoyment of food through days of feasting. In Passover Feasts of the Jewish people, in *Divali* dinners of Hindus, in Mahayana feasts on Buddha's birthday, in joyous Christmas dinners, in *Eid-ul-Fitr* and *Eid-ul-Adha* feasts of Muslims, as well as in the secular Thanksgiving dinners in the United States, all cultural groups have occasions for shared culinary delights. There is no religion or culture without the joy of shared meal, for ultimately religions and cultures are about connecting with others, with family and fellow members, bearing in mind the unfathomable grandeur of the cosmos and the inscrutable fact of existence. Jesus's breaking bread is symbolic of sharing. Every meal we share and every joyous banquet we are part of is an act of breaking bread together. Through that act we are building a bond. Even where religion is rejected one finds excuses for sharing food.

Festivals commemorate events and personages from sacred history. On such days one recalls something of significance in the culture's lore. The stories carry the weight of centuries and the authority of traditions. These occasions are for conviviality, but also for affirming the cultural roots of a community. They affirm the positive aspects of life. They give hope and prompt us to rejoice in the breath of life. Religious feasts give thanks and seek blessings.

Wherever people have more money than is required for daily dietary needs, they organize or participate in group dining and banquets, gathering many people for a formal many-course dinner. These are happy events with toasts and wines, and sometimes with speeches too.

The preparation of food is a sophisticated art. Too many cooks in the same kitchen may spoil the broth. But many cooks not only cook meticulously with the right amounts of butter and salt and spice, but also embellish and present it all with elegance. If the proof of the pudding is in the eating, the delight in the dining is in the presenting. Marzipan in the shape of vegetables and fruits is as enjoyable to behold as it is to bite. This is equally true of wedding cakes and holiday punches, and how pheasants used to be served at royal tables at one time.

There are conventions in eating. Protocols ranging from saying a prayer or *bon appétit* or its equivalent before starting, and toasting before sipping the wine. There are rules governing the placement of cutlery. In some cultures there is prohibition against belching to display one's satisfaction with the food, while in others this is a requirement.

We have festivals around foods. The *Pongal* in the Tamil world is a festival for harvests. The Afro-American festival of *Kwanza* derives its name from the Swahili phrase *matunda ya kwanza* which means the first fruits of harvest. Thanksgiving dinner in the United States symbolizes peace and cooperation between the European newcomers and the native peoples.

Since time immemorial human beings have quenched their thirst with refreshing water, but also with other fluids. The ancients thought of magical potions that the gods imbibe, making them immortal. There was *soma*, the intoxicant that transported the *rishis* of Vedic times to spiritual stratospheres. Imaginative authors have endowed liquids with magical properties and spoken about love potions, as in Tristan and Isolde where the imbibitor turned into a lover overnight. There are poisonous beverages which have spelled the end of many a monarch in history. Since ancient times humans have been transmuting grapes—green, red, or purple—and many other fruits into wines of a hundred kinds. Other grains have engendered more potent stimulants bearing a fascinating array of names like whiskey, brandy, bourbon, rum, cognac, and Curaçao liqueur.

We should forever be grateful to the Chinese people for growing *camellia sinensis*, popularly known as tea leaves which were unknown to people beyond the Great Wall until the sixteenth century. With various aromas and brand names, it is now the most widely enjoyed drink in the whole world: black tea, green tea, oolong tea and many more. With leaves and a filter, or in bags with a thread, plain or with milk or even with a pinch of sugar or a spoonful of honey, no beverage is more easily concocted and more heartily enjoyed than hot tea (Evans 1992). According to a Chinese philosopher tea is to be drunk to forget the din of the world.

Then there is the competing ubiquitous drink named after the highland called *Kaffa* in Ethiopia whence it originated. Coffee too has assumed a hundred different names and tastes and flavors. It is said that the credit for its discovery should go to a ninth century Ethiopian goat-herder by the name of Kaldi. There was a time when coffee was imagined to have magical properties, especially if imbibed with appropriate chanting (Kummer 2003).

When the Turks introduced coffee into Vienna, it spread like wildfire into Prussia. The first coffee house in Germany was established in Leipzig in 1685. The reception was both positive and negative. The introduction of coffee caused some concern to the beer lobby, and to Emperor Frederick of Prussia who felt that too much money flowed out of the country as too much coffee flowed in. Coffee was vilified as disgusting and immoral. It was banned. But the public cried for coffee and illegal roasters popped up. Poets sang the virtues of coffee and composers sang its praises. Bach wrote his famous *Coffee Cantata* for an operetta in which a father strictly prohibits his daughter from drinking coffee (Pendergrast 2001).

Desserts offer the most ecstatic of tastes: sweetness. Their backbone is refined sugar, molasses, or honey. These are at the root of the most irresistible temptations of culinary concoctions, and the richest sources of calories. There is no limit to their variety, from French pastries and Iranian *halva* to German Kuchen, Bengali *rasagulla*, Turkish baklava, and plain

old American fudge. Add to all this the varieties of chocolates with world-renowned brand names, with nuts and raisins, with fillings and without, black and milk, and we cannot but be impressed by human creativity in the context of food (Mesnier 2004). Human beings capable of making sweet delicious candies cannot be all that bad.

I am all for multiculturalism, in food as in any other context (Nenes and Robbins 2008). But in good conscience I cannot let these reflections pass by without referring to my own tradition. I will confess that when it comes to food, I have seldom enjoyed anything as much as a good Tamil *virundu chappādu* (feast). This is traditionally served on a large banana leaf which has to be properly placed in a particular orientation. The leaf has two sectors, an upper and a lower. When guests are formally seated on mats on the floor, one begins to place the items on the leaf, as if decorating it. Something sweet must be first served at the lower right side. Then, one by one, other items come. The menu is based on the principle that like the colors of the rainbow there are six fundamental tastes in vegetarian food: sweet, sour, salty, pungent (or spicy hot), bitter, and astringent. A feast should include at least one dish from each of these tastes, singly or in combination with others. It should also have something dry, something wet, something fried, something sautéed, and something saucy with lentils. The feast should invariably include rice, clarified butter (*ghee*), and buttermilk. The vegetables served in a formal feast include cauliflower, cabbage, eggplant, tomato, and peas. At least one dish should use coconut, and hot pickle should accompany the course with rice and buttermilk. Rice is served at least in two installments, first to be eaten with the saucy item, then with butter milk or yogurt. There should always be a tall glass of cold water with the feast which ends with something very sweet. This would be a typical feast at a wedding, noteworthy birthday, or important festival. It is said that people who are accustomed to this kind of feast are generally cheerful, good-humored, and friendly.

If I speak in such adulatory terms about the richness and uniqueness of Tamil food, it is not because I am a chauvinist, nor even because whatever I have said it is absolutely true, but rather to show how deeply we are all touched by and connected to the cuisine in which we have been raised. The culinary attachment to which every cultural being has been accustomed since childhood has a special charm and very strong appeal.

Cuisine is the source of psychological and even spiritual comfort that only another exemplar in human culture can match. And that is religion. No matter how trustworthy and fulfilling a religion is to its practitioners, we should never forget, as with food, the role that upbringing plays in its formation. This recognition need not diminish our respect and devotion to what we hold to be true and of immense value. But it can enable us to show respect and consideration for similar attachments that others have for their own. That is an important message that needs to be propagated

in the multicultural, multireligious, and multicuisine world in which we live.

CONCLUDING THOUGHTS

Not everything we hear about food these days is cheerful, uplifting, and hopeful. The threats of drought and pollution, of genetically modified and scarcity are not reassuring. But there is one reassuring thought that can keep us from sinking into utter despair: We humans have extraordinary resiliency. People may die of epidemic and starvation, people may be killed in natural disasters, people may fight among themselves and slaughter one another in the name of God and sectarian bigotry, nation and ideology. But as a species, barring a brutal asteroid intrusion, *Homo sapiens* will not give in that easily. For more than a million years we have managed to survive. A thousand years from now, there will still be humans on this planet.

In the meanwhile, whenever and whatever we eat, let us do so *without* feelings of guilt, for nothing is served by feeling sorry for ourselves simply because we are not among the hungry of the world. As the Prophet Isaiah said: "Eat ye that which is good, and let your soul delight itself in fatness." (Isaiah 55:2, King James Version) Let us always eat in a spirit of thankfulness even if we do not know whom to thank. At every meal let us reflect a little on the less fortunate of the world. Let us put a coin or two for every full meal we eat, and periodically contribute the collection to soup kitchens and organizations that bring food to the hungry all over the world.

Let us conclude by recalling the opening and closing stanzas of the poem *The Best of All the Joys*.

Of all the joys that come in life,
Save the boudoir bliss of man and wife,
If I'm asked to name the one
That gives the most delight and fun:

....

Of all the frivolous and fleeting joys
For young and old, for girls and boys,
There's nothing that can make one feel
More satisfied than a gourmet meal (Raman 2002, p. 192).

NOTE

This article is based on a series of Chapel Talks offered at the Summer Conference of the Institute on Religion in an Age of Science on the topic "Scientific, Spiritual, and Moral Challenges in Solving the World Food Crisis" held at Silver Bay, New York, July 27 to August 3, 2013.

REFERENCES

- Bonavia, Duccio. 2013. *Maize: Origin, Domestication, and Its Role in the Development of Culture*. Cambridge: Cambridge University Press.
- Bonjean, Alain P., and William J. Angus, eds. 2001. *The World Wheat Book: A History of Wheat Breeding*. Paris: Lavoisier Publishers.
- Bronowski, Jacob. 1973. *The Ascent of Man*. Boston: Little, Brown.
- Diamond, Jared. 1997. *Guns, Germs, and Steel: The Fates of Human Societies*. New York: W. W. Norton.
- Egerton, Frank N. 2007. "Understanding Food Chains and Food Webs, 1700–1970." *Bulletin of the Ecological Society of America* 88(1):50–69.
- Evans, John C. 1992. *Tea in China: The History of China's National Drink*. New York: Greenwood Press.
- Heiser, Charles B. 1900. *Seed to Civilization: The Story of Food*. Cambridge, MA: Harvard University Press.
- Kummer, Corby. 2003. *The Joy of Coffee: The Essential Guide to Buying, Brewing, and Enjoying*. Boston: Houghton Mifflin.
- Laws, Edward A. 2000. *Aquatic Pollution*. New York: John Wiley.
- Mauseth, James D. 2003. *Botany: An Introduction to Plant Biology*. Boston: Jones and Bartlett.
- Mesnier, Roland. 2004. *Dessert University*. New York: Simon & Schuster.
- Nenes, Michael F., and Joe Robbins. 2008. *International Cuisine*. Hoboken, NJ: John Wiley.
- Pendergrast, Mark. 2001. *Uncommon Grounds: The History of Coffee and How It Transformed Our World*. London: Basic Books.
- Raman, Varadaraja V. 2002. *Random Rhymes and Various Verses*. Philadelphia, PA: Xlibris.
- Science Recorder. 2014. "Fasting Could Have Protective Effects for Immune Cells such as White Blood Cells" (June 8). Unpaginated online document. <http://www.sciencerecorder.com/news/fasting-may-help-protect-against-immune-related-effects-of-aging/>
- Sen, Amartya. 1982. *Poverty and Famines: An Essay on Entitlements and Deprivation*. Oxford: Clarendon Press.
- Simoons, Frederick J. 1994. *Eat Not This Flesh: Food Avoidances from Prehistory to the Present*. Madison: University of Wisconsin Press.
- Vaughan, John G., Catherine Geissler, Barbara E. Nicholson, Elisabeth Dowle, and Elizabeth Rice. 1997. *The New Oxford Book of Food Plants*. New York: Oxford University Press.
- Xenophon. 2009. *Anabasis*, tr. H. G. Dakyns. New York: Project Gutenberg.