

Introduction

The classical yogic practices of pranayama have been known in India for over 4,000 years. In the *Bhagavad Gita*, a text dated to the Mahabharata period, the reference to pranayama (4:29) indicates that the practices were as commonly known during that period as was *yajna*, fire sacrifice. Many Upanishads written in the pre-Buddhist period also refer to techniques of pranayama (to attain higher states of consciousness). However, it is in the hatha yoga texts such as *Hatha Yoga Pradipika*, *Gheranda Samhita* and *Hatharatnavali*, written between the sixth and fifteenth centuries AD, that we find a detailed description of the practices. It would seem that a need was felt at that time to revive and codify the practices that were until then handed down through the oral tradition. The vedic culture had declined with the advent of Buddhism and many yogic practices were being lost or misapplied by their practitioners. Thus the authors of the texts sought to restore the purity and authenticity of the practices.

A need is felt yet again in the twenty-first century to reinstate the original intent and experience of the practices. The yogic renaissance witnessed in the last few decades has made asana and pranayama into household terms, but the essence and depth of the practices remain unexplored for most practitioners.

It has been the purpose as well as the contribution of Satyananda Yoga to bring the knowledge of the realized rishis to yoga aspirants in a language and method that is applicable in the current age. This is also the gift and blessing of our gurus, Swami Sivananda and Swami Satyananda.

This book provides a complete description of the science of pranayama as presented in the classical texts and as taught in the Satyananda Yoga tradition by the Bihar School of Yoga. Prana and pranayama are investigated as philosophy, physiology and practice. The scriptural analogies of the concept of prana have been rendered comprehensible for the modern reader so that an essential understanding of the basis of the practices is acquired. In addition, the scientific framework of the concepts is explained, and the practices are presented in a stage-by-stage, systematic method so that the yogic counsel of gradual perfection may be understood and practised.

The book is divided into three parts. *Part 1* explains the theory of prana, and related yogic concepts such as koshas, chakras, nadis and mantra. *Part 2* describes respiratory physiology as relevant in understanding yogic and pranic physiology, the process of pranayama and the research undertaken by science on pranayama and related practices. *Part 3* provides the guidelines for practising pranayama, and the preparatory and classical practices of pranayama. There are also four appendices describing yogic practices that complement pranayama, including neti and agnisar kriya, asanas, mudras and bandhas. The pranayama sutras from the *Hatha Yoga Pradipika* are also provided as an adjunct.

Prana

The Upanishads tell the following story. Once all the deities that reside in the body - air, fire, water, earth, ether, speech and mind - had an argument. Each claimed that it was superior to all others, declaring, "I sustain this perishable body." Prana was listening to this debate, and ultimately said to them, "Do not delude yourself. It is I, having divided

myself into five parts, who supports and sustains this body." The deities did not believe him. Indignantly, Prana began to withdraw from the body. Instantly, all the other deities found themselves withdrawing too. When Prana again settled in the body, the deities found that they had assumed their respective places. Convinced of Prana's superiority, all now paid obeisance to Prana.

Prana is the vital force that sustains not only the body, but also creation at every level. The seers of India have always known what modern science has been trying to fathom: the existence of a primeval force, its nature, potential, and how to harness it. Every yogic science - mantra, yajna, austerities, different forms of concentration and meditation - is aimed at awakening and enhancing this vital force within the unit of the individual or the wider universe.

The Sanskrit word *prana* is a combination of two syllables, *pra* and *na*, and denotes constancy, a force in constant motion. Prana exists in sentient beings as the energy that drives every action, voluntary and involuntary, every thought, every level of the mind and body. Scientific research describes prana as a complex multidimensional energy: a combination of electrical, magnetic, electromagnetic, photonic, ocular, thermal and mental energies.

Prana also exists in the insentient world, causing motion, growth and decay at this level. Prana is, indeed, the basis of manifested creation. It is the force that emerged out of the 'original willing' of the primal consciousness to bring about creation. The *Chhandogya Upanishad* (1:11:5) says:

सर्वाणि ह वा इमानि भूतानि ।
प्राणमेवाभिसंविशन्ति प्राणमभ्युज्जिहते ॥

In prana all moveable and immoveable beings merge (during dissolution) and rise out of prana (during creation).

In the individual being, prana pervades the entire being, projecting itself in what the yogis called pranamaya kosha - a level of existence subtler than the physical. The existence

of this pranic field has been proven by modern science too. In particular, the highly sensitive system of Kirlian photography noted the existence of a halo around people as well as objects. It also found that the halo changed according to the state of the being. This pranic field is sometimes called psi plasma due to the fact that it can be likened to the plasma (charged gases) described in plasma physics; it has been described as a vapour of charged particles which can be affected internally by the mind and externally by electric, magnetic or electromagnetic fields.

In the pranic body, prana flows through *nadis*, energy channels, and is stored in *chakras*, energy vortices. According to some researchers, the electromagnetic energy in prana gives rise to radiation in which the waves of electric energy and magnetic energy are at ninety degrees to each other, resulting in what looks like a spiral. Indeed, the spiral radiation structure around chakras has been seen, described and drawn by sages and savants from all parts of the world at different times.

Prana is inherent to a being. We are born with a certain quantum of prana, and we maintain it, increase or decrease it through the air we breathe, the food we eat, the thoughts we think, the actions we perform and the kind of life we lead. When we die, the accumulated prana leaves the body.

Pranayama

The science of pranayama was developed by highly evolved yogis through an intuitive and experiential understanding of prana and its influence on the human mechanism at various levels. The agency of the breath was used to access the pranic field, to attain balance in the body and control of the mind. The practices would render the body-mind instrument capable of experiencing higher states of consciousness so that the ultimate union with the transcendental reality could be experienced.

The breath being the medium of pranayama, the system is based on the three stages of respiration: inhalation (*pooraka*),

retention (*kumbhaka*) and exhalation (*rechaka*). By permuting and directing these three stages, the different practices of pranayama are obtained. Technically speaking, pranayama is actually only retention. Maharshi Patanjali's *Yoga Sutras* state (2:49):

तस्मिन्सति श्वासप्रश्वासयोर्गतिविच्छेदः प्राणायामः ॥

Pranayama is the pause in the movement of inhalation and exhalation when that is secured.

Inhalation and exhalation are methods of inducing retention. Retention is the key because it allows a longer period for the assimilation of prana, just as it allows more time for the exchange of oxygen and carbon dioxide in the cells. As the breath is also intimately connected with various functions and organs of the body as well as the mind, by controlling the breath we also influence all these dimensions.

At the pranic level, in their initial stages the practices of pranayama clear up the *nadis*, energy pathways in the body. The scriptures say there are over 72,000 nadis or pathways of prana in the pranic body and six main chakras. However, in the average individual, many of these pathways are blocked and the chakras release energy only partially. In other words, we do not utilize our full potential in terms of energy, mind and consciousness. The negative conditions we experience, whether physical or mental, are the cause as well as the consequence of the blockages. The state of our nadis and chakras are defined by our *samskaras*, conditionings carried in seed form, as well as *purushartha*, self-effort and *anugraha*, grace. With the practice of pranayama, these pathways of energy are gradually freed so that prana moves through them smoothly.

At higher levels of practice, the direction of the pranic flows is influenced and a greater quantum of energy is released from the chakras. As these processes are activated, many new experiences unfold. Expert guidance is essential to steer the practitioner through these stages.

Remember that pranayama is not a stand-alone yogic practice. In the system of ashtanga yoga, it is preceded by sustained practice of yamas and niyamas, shatkarmas and asanas, and is followed by pratyahara, dharana, dhyana and samadhi. A balanced, sequential movement from gross to subtle, from annamaya kosha to anandamaya kosha, is the aim. In the *Hatha Yoga Pradipika* (1:67) it has been said:

पीठानि कुंभकाश्चित्रा दिव्यानि करणानि च ।
सर्वाण्यपि हठाभ्यासे राजयोगफलावधिः ॥

Asanas, various types of kumbhaka (pranayama) and the other various means of illumination should all be practised in the hatha yoga system until success in raja yoga is attained.

In this context, the aim of pranayama is to perfect pratyahara, which in the traditional texts has been described as not just sense withdrawal, but the state where we perceive every sensory input as a manifestation of the Supreme, and have expanded the pranic capacity to the extent that we can retain the breath for three hours. The *Shiva Samhita* (3:57) states:

याममात्रं यदा धर्तुं समर्थः स्यात्तदाद्भुतः ।
प्रत्याहारस्तदैव स्यान्नांतरा भवति ध्रुवम् ॥

When one attains the power of holding the breath for three hours, then certainly the wonderful state of pratyahara is reached without fail.

The practice of yoga, in fact, begins when we come to the pranayama series. With the practice of asanas, we arrive at the state where we are able to work with the energies controlling the body. With pranayama, through the breath, we develop an awareness of the subtle force within the body, and directing the mind to become aware of the subtle activities is the beginning of yoga.

Philosophy of Prana and Pranayama

What is Prana?

What makes any motion possible: the blink of an eye, the budding of a flower, the splitting of atoms or the fall of a meteor? Thousands of years ago, the yogis living in the shadow of the Himalayas fathomed the inherent quality of motion in creation and they called it prana. One may roughly translate the word *prana* as 'energy' or 'vital force', but neither definition offers a precise equivalent of the Sanskrit term that emerged from higher states of contemplation. The word prana assumes the quality of 'livingness'. From the yogic point of view, the entire cosmos is alive, throbbing with prana.

Prana is ever present in every aspect of creation. The prana within every created object gives existence and material form, whether it is a planet, an asteroid, a blade of grass or a tree. If there were no prana, there would be no existence. If prana were withdrawn from the universe, there would be total disintegration. All beings, whether living or non-living, exist due to prana. Every manifestation in creation forms part of a never-ending matrix of energy particles, arranged in different densities, combinations and variations. The universal principle of prana may be in a static or dynamic state, but it is behind all existence on every plane of being from the highest to the lowest.

Prana is the simplest as well as the most profound concept propounded by the seers. A stone worshipped sincerely may have a finer quality of prana than the force of a leopard in

full flight. The tangible strength that enables the movement of one's hand is prana and the intangible force invoked through a complex fire ritual is also prana. The wind blows and rivers flow because of prana. Aircrafts, trains and cars move because of prana; laser beams and radio waves travel because of prana. Every object in creation is floating in the vast, all-encompassing sea of prana, and receiving everything they need to exist from it. It is said in the *Kathopanishad* (2:3:2):

यदिदं किं च जगत्सर्वं प्राण एजति निःसृतम् ।

This whole world - whatever there is - vibrates having originated from prana.

This cosmic prana, also called *mahaprana*, came into being at the time of creation. Thus, in order to fully understand prana, one must go back to the beginning of creation.

Universal prana

At the very beginning, there was nothing, not even creation. What existed was an all-pervasive, unmanifest consciousness, known in the scriptures as *Para Brahman*. It contained within it all the qualities and components necessary for creation. The whole universe lay infinitely contracted in it as mere potency; prana remained completely absorbed in it as if in a union of deep embrace. It was a state of perfect equilibrium and harmony.

In this utter stillness, there is a movement. The tantric and vedic literatures state that a desire arose in that absolute principle: *Ekoham bahusyam* - "I am one, let me become many." The desire is the first creative impulse, which results in 'willing'. The willing of the unmanifest consciousness causes the first *spandan*, vibration, and energy issues forth. It is the first movement: the first moment of becoming from being, the first manifestation of prana.

This primal energy, called mahaprana, is variously known as mahashakti, mahamaya, the cosmic creatrix or the Cosmic Mother. Prana was never separate from consciousness; it

existed eternally as potential in consciousness, but now it assumed itself. Thus energy and consciousness began to interact with each other. They indulged in cosmic play, *lila*, which caused *srishhti*, creation. The awakening of mahaprana was like a self-projection of the 'I-ness' of the infinite consciousness - the unchanging consciousness could experience itself through the movement of prana. In the course of time, modifications took place in the states of consciousness and energy, and with each modification a different level of creation came into being. Different levels of existence manifested: beings and matter, elements and energies, light and dark, positive and negative, animate and inanimate, male and female. Together, consciousness and energy expanded the universe, and at the end of every age dissolved it, gathering the universe back into themselves.

The many subtleties of prana and *chitta* (consciousness) are the ladders of all spiritual practices, the ultimate rung being involution to the state where all that exists is pure consciousness. This is the process of going back to the 'source'.

Play of prana and chitta

चले वाते चलं चित्तं निश्चले निश्चलं भवेत् ।
योगी स्थाणुत्वमाप्नोति ततो वायुं निरोधयेत् ॥

When prana moves, chitta (consciousness) moves.
When prana is without movement, chitta is without movement.

—*Hatha Yoga Pradipihā* (2:2)

Both prana and consciousness must be present for life to exist. The conscious experience is chitta; that which takes one closer to the conscious experience is prana, and that which motivates prana is *vasana*, inherent desire. So, prana and *vasana* are the two supports of consciousness. A living being is called a *prani*, one who has prana and thus consciousness. It is not that consciousness is the cause of existence and prana the result; nor is prana the cause or

consciousness the result. They are two aspects of existence which determine the nature of everything.

Consciousness is being, awareness, knowledge; prana is becoming, manifestation through motion. Consciousness is a dormant experience whereas prana is the active principle of manifest energy. They are the two eternal principles that are the basis of the macrocosmos and the microcosmos. Everything is a combination of prana and chitta. The entire universe, creation and existence are a play of consciousness and energy. The life force and mental force permeate every atom and cell of the universe, though remaining at different degrees of separation.

Individual prana

In the *Shiva Swarodaya*, Devi asks Shiva: "In this universe who is the greatest friend of man?" Shiva replies (v. 219):

प्राण एव परं मित्रं प्राण एव परः सखा ।
प्राणतुल्यः परो बन्धुर्नास्ति नास्ति वरानने ॥

Prana is the greatest friend, prana is the greatest companion.

O fair one, there is no closer friend in this universe than prana.

All beings are composites of prana, which gives them life and existence. The quantum of prana of each individual is indicated by the power of the personality, which reflects one's natural capacity to wield prana. Some persons are more successful, commanding and fascinating than others due to the level of their prana. The *Prashnopanishad* explains that prana springs from the atman and is as inseparable from the self as the shadow from one who casts it.

Often the word prana is translated as breath. However, prana is not the oxygen or the air that one breathes. Yogis have proved that one can stop breathing for long periods of time and yet continue to live. An experiment was conducted at the Menninger Foundation, USA, on Swami Nadabrahm-

ananda Saraswati, an initiate disciple of Swami Sivananda Saraswati of Rishikesh. Swami Nadabrahmananda had perfected *Nada Brahma*, attunement with the primordial sound vibration, and the experiment intended to verify his claim that lie could remain comfortably without breathing for extended periods. He was placed in an airtight glass chamber. A lighted candle and a live monkey were placed in similar chambers. Electrodes were connected to his heart, brain and different parts of the body, and he was asked to play the tabla while instruments monitored his parameters. His nose and ears were blocked and his whole body was smeared with wax, so that air would not pass through the pores.

After three minutes the candle went out, and after fifteen minutes the monkey fell unconscious, but Swami Nadabrahmananda continued to play the tabla for more than forty minutes. During this period he was not breathing and when a coin was placed on top of his shaved head, it bobbed up and down. When a microphone was placed against any part of his body, a loud, constant sound like that of a waterfall was heard. He explained that this sound was the movement of prana, adding that one continues to live as long as the pranas are active, even if one stops breathing. The *Hatha Yoga Pradipika* (2:3) echoes his statement:

यावद्वायुः स्थितो देहे तावज्जीवनमुच्यते ।
मरणं तस्य निष्क्रान्तिस्ततो वायुं निरोधयेत् ॥

As long as the vayu (prana) remains in the body, there is life.

Death occurs when the vayu leaves the body, therefore, retain the vayu.

Receiving prana

Prana is the dynamic principle within everything. Everyone is born with a certain quantum of prana, but the quantity and quality change continuously, as one goes through life. Positive thoughts, higher feelings and yogic practices generate

higher levels of prana. When the sexual energy is sublimated or transformed, substantial prana is conserved within the system and converted into *ojas*, a subtler form of energy. This energy accumulates in the brain and is utilized for creative and spiritual development. A yogi stores an abundance of prana within him, just as batteries store electricity. The megawatts of his prana radiate strength, health and vitality to all around him. He is a powerhouse of energy, providing prana to everyone who comes in contact with him. Swami Sivananda says, "Just as water flows from one vessel to another, prana flows like a steady current from a developed yogi towards weak persons."

At the material level one also receives prana from the environment, food, water, sun and air. All the elements are comprised of prana. So, the quantum of prana within each individual is influenced by the quality of the elements to which one is exposed and which one ingests in the course of everyday life.

Pranic value of food: The *Bhagavad Gita* refers to the quality of prana in different foods by categorizing them as sattwic, rajasic and tamasic (17:8-10). In recent times, a method was developed by André Simonéton in France for establishing the pranic value of food. He used a simple pendulum on a piece of string, similar to that used by water diviners for dowsing, for this purpose. The subtle radiations emitted by organic matter affect the motion of a pendulum, causing it to swing and spin. By measuring the distance of a pendulum's arc, and the speed of its spin, Simoneton was able to measure specific wavelengths, which indicate the intrinsic vitality and relative freshness of different foods. He published his research in *Radiation des Ailments, Ondes Humaines, et Santé*.

On the basis of his findings, Simonéton divided food into four general classes. On a scale of zero to 10,000 angstroms, he found the basic human wavelength to be about 6.5 thousand. Foods that have wavelengths between this and 10,000 angstroms, he regarded as those of the highest quality.

In this first class are fruits, fresh vegetables, whole grains, olive oil, ocean fish and shellfish. In the next class, with radiations 6.5 thousand to 3,000 angstroms are eggs, peanut oil, wine, boiled vegetables, cane sugar and cooked fish. The third category, with very weak radiations below 3,000 angstroms, is comprised of cooked meats, sausages, coffee, tea, chocolate, jams, processed cheeses and white bread. The fourth category exhibits practically no life force and includes margarine, conserves, alcoholic spirits, refined white sugar and bleached flour.

Simonéton also found that food with a vital radiance of 8,000 to 10,000 angstroms caused the pendulum to rotate at the amazing speed of 4-500 revolutions per minute over a radius of 80 millimetres. Those between 6,000 and 8,000 angstroms spin at 3-400 revolutions per minute over a radius of 60 millimetres. However, meats, pasteurized milk and overcooked vegetables, which have a value of less than 2,000, are too low in energy to cause the pendulum to revolve at all. This substantiates the recurrent yogic advice to maintain purity of diet, especially while practising pranayama.

Pranic value of air: Pure air is essential for life and health, not only to satisfy the requirement of oxygen, but also the need for prana. The quality of air one breathes affects one's energy level directly. The exhilaration and vitality experienced near a waterfall or high in the mountains is because the quantum of prana in the air is significantly higher in these places. On the other hand, when one is exposed to air pollution or recycled air, the energy level quickly begins to decline. Science has explained this phenomenon in terms of ions, charged particles in the air that are formed when enough energy acts on a gaseous molecule to eject an electron. Ions may be negative or positive. When the displaced electron attaches itself to an adjacent molecule, it becomes a negative ion. The original molecule then becomes a positive ion.

These positive and negative ions are the components of the air one breathes. When one inhales negative ions, they

increase the level of prana in the body. The opposite effect is experienced on inhalation of positive ions. Inside a closed room in a modern city there may be less than 50 negative ions per square foot and in the mountains there are about 5,000. It is now an established scientific fact that depletion of negative ions leads to discomfort, enervation, lassitude and some degree of mental and physical inefficiency. Negative ions are therapeutic partly because they kill germs. In human beings, they act on the capacity to absorb oxygen, accelerating the blood's delivery of oxygen to cells and tissues. Negative ions are not prana, but when one inhales them the level of prana in the body increases. In this context it is interesting that negative ions work only so long as they are being inhaled. It has also been observed that the ability to assimilate negative ions goes up during yogic practices such as pranayama.

Working with prana

Prana is not received solely from external sources; it is also self-generated and its quality can be refined and directed. One can work with one's own prana to enhance vitality, will and strength, cure diseases, boost capability and efficiency, and evolve to a higher consciousness. In fact, one must work with *prana shakti*, force of prana, in order to perfect any experience in life. This is the aim of pranayama and prana vidya, which are tangible methods to enhance and guide prana.

The breath is the external manifestation of prana. The yogis state that prana is sustained and the duration of life is prolonged by deliberately decreasing the distance of the exhaled air. Based on this fact, they devised a technique to measure the prana expended during different actions. They stated that the pranic outflow can be gauged by observing the length of the exhalation during different actions. The longer the air current, the more prana is utilized. The average length of exhaled air is twelve digits (nine inches). While singing the length becomes sixteen digits (one foot), while eating twenty digits (fifteen inches), while sleeping thirty digits (twenty-two inches), while copulating thirty-six

digits (twenty-seven inches), and while performing physical exercise, it is much longer.

Maximum prana is utilized by the brain. If the brain is not supplied with sufficient prana, the mind becomes restless and disturbed, and constantly dives into negative thoughts. This is evident from the fact that when one is hungry or ill, one tends to become irritable. The quantum of prana in the body has gone down and the brain circuits are protesting the lack.

Although the breath is gross and prana is subtle, the two are intrinsically connected. One can influence the level of prana shakti in the body with the help of the breath. When prana is influenced through modification of the breath, all the functions of the body, brain, mind and consciousness are affected. The practices of pranayama raise the levels of prana by working with the breath and lead to *prana vidya*, inner knowledge or experience of prana. A significant outcome of pranic awareness is that one is able to gain control over the mind.

When prana moves, the mind thinks and the senses perceive their respective objects. By developing sensitivity to prana, one becomes more aware of the subtle forces of the mind, which arise in the form of thoughts, feelings, emotions, responses, impressions, symbols and knowledge. Prana is grosser than the mind and hence easier to control. Thus, when prana is caught the flighty mind is caught too. The *Hatha Yoga Pradipika* (2:42) states:

मारुते मध्यसंचारे मनःस्थैर्यं प्रजायते ।
यो मनःसुस्थिरीभावः सैवावस्था मनोन्मनी ॥

The movement of the breath in the middle passage makes the mind still.

This steadiness of mind is the state of manonmani (devoid of thought).

As one works with prana and its quantum and quality improve, the dormant areas of the brain awaken. Normally only one-tenth of the human brain is active and the other nine parts remain inactive. This is because a high level of

energy is required for the whole brain to function simultaneously. The yogic practices are able to supply such a quantum of energy and awaken the genius in an average individual. However, just a few rounds of pranayama performed hurriedly will not achieve this. Sustained practice with deep concentration, acute awareness and unshakeable faith are the requisites of a yogi.

Experience of cosmic prana

The individual prana within each being is a part of the cosmic sea of mahaprana, but until this truth is realized experientially, one sees oneself as separate from the rest of the universe. Pranayama practices activate the individual prana and raise it to a higher frequency. They generate a certain amount of heat or creative force throughout the body. This influences the existing quantum of prana, which makes its way up to ajna chakra, the psychic centre in the midbrain, and can then be directed to different areas of the body. This process is the basis of prana vidya.

When prana sadhana assumes an even higher level, the amount of heat generated within the system becomes more intense. This leads ajna chakra to monitor a message back to mooladhara chakra, the psychic centre located at the perineum. Mooladhara is the abode of kundalini, where the cosmic prana lies dormant. The entire experience from creation to dissolution is embedded within the folds of kundalini, hence it is also known as *atma shakti* or soul force. The message from ajna stirs this force and an awakening of the great prana takes place. When the full potential of this energy is released, it travels up through the sushumna nadi, bringing about a complete metamorphosis of the individual. Cosmic prana and kundalini are synonymous terms. In awakening the kundalini, one unites with the cosmic prana.

At the time of the awakening, the two forces of prana and chitta assume perfect balance within the individual and become one. The mind undergoes a state of fission and energy issues forth. There is an explosion of *satya*, a moment

of Truth, when one sees everything as luminous. One experiences oneself in every object of the universe, every person, leaf and rock. The realization of cosmic prana is attained and the experience of separation dissolves. People who have experienced this union are called saints or liberated beings, as they have transcended duality by taming the infinite, universal energy within the microcosmic unit. The ultimate yoga is experienced at this level, where one discovers the abiding consciousness, *sat-chit-ananda*, truth, expansiveness and beatitude.