

have been made for such an identification, at least in the cases of the important Nāḍis but all of them, so far we know, have been of a literary character. No strictly scientific effort has been made to this day. Being pledged to a policy of strict scientific accuracy, we cannot accept the results of the efforts as scientifically sound. We too have many hypothetical conclusions regarding Yogic anatomy and physiology. But we do not wish to place them before the public as scientific, unless we test them in the laboratory.

students of Yoga. As such, we are afraid, we cannot accept his conclusions as scientifically sound. Nay, we have serious doubts regarding the accuracy of many of his interpretations, and the whole book seems to be of doubtful scientific value. Dr. Rele very frankly admits in his preface to the book that his interpretations are 'possible suggestions only'. Another attempt in this direction that deserves special mention here, is that of the great Swāmī Vivekānanda. His lectures on Rāja - Yoga are full of interpretations of Yogic things in the light of modern sciences. We are sorry to note here that the Swāmīji's attempt suffers from the same drawbacks as the work of Dr. Rele. The whole structure is based upon the treacherous sands of speculation. Being pledged to accept nothing, in the field of scientific interpretation, as sound, unless it is backed up by laboratory evidence, we cannot accept the conclusions of the great master as scientific. We do not want to be misunderstood. We make a distinction between Yoga as a reliable guide for spiritual evolution, and Yoga being scientifically interpreted. Since time immemorial, Yoga is being practised as a means to self-realization. The traditional practices are as sound as anything known to modern science. We have adamant faith in the efficacy of these exercises as a means to spiritual evolution.

For the information of our readers, however, we shall mention the modern interpretations put upon the words Nāḍī, Suṣumnā, Idā and Piṅgalā. Without going into details, we shall also broadly

But the scientific interpretations of the Yogic practices and Yogic anatomy and physiology, is quite a different thing. It means trying experiments upon these practices in the laboratory according to the strict scientific methods and basing one's conclusions on the results thus obtained. Evidently Swāmī Vivekānanda never tried these experiments and had to resort to speculation. This is a statement of facts and there is no intention to find fault with the Swāmīji's. His lectures on Rāja-Yoga are master-pieces of inspirational literature. We ourselves owe a deep debt of gratitude to the great master, especially as the author of his *Lectures in Rāja- Yoga*. A third attempt which compels attention is that of Dr. Brajendra Nath Seal. In his very valuable book, *The Positive Sciences of the Ancient Hindus*, the Doctor attempts scientific interpretations of some of the yogic anatomical terms. Even though his interpretations are better than those of Swāmī Vivekānanda and anticipate in particular respects those of Dr. Rele, they cannot be treated as scientifically sound. They are not supported by any laboratory evidence. But the oldest attempt in the direction of scientifically interpreting the Yogic anatomy seems to have been made by Major B.D. Basu who published an article on this subject in *The Theosophist* as far back as 1888. His interpretations though speculative certainly claim great admiration. It is a pity that those who followed Major Basu did not take advantage of his precious work. It is greatly suprising to find Dr. Rele not acknowledging his debt both to Major Basu and Dr. Seal, each of whom has anticipated some of his interpretations. Perhaps he did not know their works.

say whether these interpretations are acceptable to us or not. Our acceptance or otherwise has, however, absolutely no scientific value, as it is based upon mere guesswork today.¹⁸

Nāḍīs have been identified with the nerves of modern anatomy. Although there are places in Yoga literature where the word Nāḍī has definitely been used in some other sense, this interpretation is on the whole acceptable to us. In fact the description¹⁹ of the Nāḍī in general given in one of the Yogic text-books, is so vivid and accurate, that there is little scope for any difference of opinion regarding the interpretation.

18. We are trying our best to equip our laboratory with such apparatus as would enable us to conduct experiments on the Nāḍīs. Everything else is ready. And by the grace of the Lord, we feel sure we shall soon have the desired equipment also. We are glad to state that our Laboratory equipment has greatly improved since the preceding statement was made and our experimental work is going on apace.

19. नाड्यस्तु ता अधोवक्त्राः पद्मतन्तुनिभाः स्थिताः ।

पृष्ठवंश समाश्रित्य... ॥ Śiva-Saṁhitā II 17

(These Nāḍīs are like the fibres of a lotus, and being supported by the vertebral column, spread downwards.)

The same may be said about Suṣumnā. It is explained as the spinal cord. We do not *much*²⁰ object to this interpretation.

Idā and Piṅgala are identified by Swāmī Viveknānda²¹ with the sensory and motor tracts of the spinal cord. We cannot accept this interpretation, however, as it does not tally with the description of these Nāḍīs in the original Sanskrit texts. Dr. Rele's interpretation²² of Idā and piṅgala as the mere chains of central ganglia, one on either side of the middle line of the vertebral column, is almost acceptable to us. In fact hypothetically we had come almost to this very conclusion even before Dr. Rele's book was published. Even now, however, we have some difficulties in

20. We say *much* because we too think that Suṣumnā is to be identified with the spinal cord. But we are not sure as to whether it is to be identified with the entire cord or only with a part of it, that is, the spinal canal. However we are more inclined to identify Suṣumnā with the spinal canal. The whole trouble about exact anatomical interpretation of Suṣumnā is due to its identification with Brahmanāḍī at several places in ancient Sanskrit literature. However so far as Sanskrit texts on Haṭhayoga are concerned Suṣumnā mean Spinal Canal alone.

21. "Thus asserts the Swāmījī in his *Lecture on Rāja Yoga* :-
The columns of sensory and motor fibres in the spinal cord are the Idā and Piṅgalā of the Yogins. They are the main channels through which the afferent and efferent currents travel."

22. Dr. Rele in his *Mysterious Kuṇḍalinī* writes :-

"From the description of the Nāḍīs. Idā and Piṅgalā, they are nothing but the gangliated cords of the sympathetic system. Which we know are situated (one?) on each side of the spinal column".
p.35.

fully accepting this identification of Idā and Piṅgalā as even hypothetically final. Most probably we will have to modify it a little.

We have thus far studied the speculative identification of the Nāḍīs. Now we go to note a few more points concerning the, because they often occur in Yogic literature. In fact in our Laboratory our colleague Dr. S.L. Vinekar has succeeded in scientifically studying the discharges from the mucous membrane of the two nostrils and found that the discharges from the two nostrils give different electric potentials. This study may help us later on to decide the truth or otherwise of this belief with the help of more sensitive pieces of apparatus.

It is believed that inhalation through the right nostril creates heat in the body and inhalation through the left nostril creates cold. This has most probably led Yogins to describe the right Nāḍī, that is, Piṅgalā as Sūrya-Nāḍī. Sūrya means the sun and is the symbol of heat. In the same way Idā is called Nāḍī, Candra, the *moon*, standing as a symbol of cold.

Again the word Nāḍīs stands for the nostrils. Thus Sūrya-Nāḍī means either Piṅgalā or the right nostril, and Candra Nāḍī means either Idā or the left nostril.

What has been said upto now is intended to get the modern student of Yoga in touch with the traditional phraseology. We have also given some hints to the practical student of Yoga. Before closing this chapter, we shall, however, make some more practical suggestions to our readers.

Oxygen Value versus Nerve Culture Value of Prāṇāyāma

The Westerner looks to exercise in deep breathing mainly from the point of view of its oxygen value.²³ He appreciates these exercises principally because they give him a larger quantity of oxygen to vitalize his system. With us the oxygen value of Prāṇāyāma is subordinate. We prize it more for its usefulness in nerve culture.²⁴ We make this statement not only for the spiritual culturist but for the physical culturist also. Let it be, however, borne in mind that even the oxygen value is not below our attention.

The Place

Hence whether the student takes to Yoga for spiritual culture or physical, he must practise Prāṇāyāma in a very well ventilated place. He should not allow himself, however, to be exposed to a strong draught. Practising Prāṇāyāma in the open is extremely healthy. A spiritual culturist should, however, see that he avoids all disturbing factors. In his case the need for utmost concentration is extreme. Hence, it is desirable that he chooses a thoroughly ventilated room which is free from mosquitoes etc. and where he

23. We are conducting a number of experiments in our laboratory on the oxygen value of Prāṇāyāma. The whole material will be placed before the public when it is ready for publication. The data being collected are likely to add to our present day knowledge of metabolism.

24. For a full discussion on this very interesting but controversial point, we refer our readers to Yoga-Mīmāṃsā. In that journal we have put forth convincing evidence based on laboratory and clinical experimentation.

would be left to himself. Even the possibility of being disturbed, comes in the way of perfect concentration. If he could reserve a room for this work and build up a spiritual atmosphere there, it will help him a good deal in his work.

The seat

For a spiritual culturist the traditional arrangement of seating is excellent. A carpet of Kuśa²⁵ grass, with a well tanned deer hide,²⁶ spread on it, the hide in its turn being covered with a daily washed piece of thick khaddar, makes a very comfortable seat. The pleasures of such a seat are the peculiar privilege of those god-intoxicated aspiring souls who seek salvation through Yoga. The thrilling spiritual experiences that this seat affords to the student from day to day, make it more attractive to him than even the throne of an emperor !

A physical culturist is by no means barred from using such a seat. Even to him it will have its own attraction. But he need not be very particular about its use. He can practise his Prāṇāyāma

25. In the absence of a Kuśa grass carpet, any other grass carpet will serve the purpose.

26. Those that may have a conscientious objection to the use of a hide should make use of a thick woollen cloth folded over several times.

while sitting, or while standing or even while walking.²⁷ It is with the intention of giving the physical culturist an opportunity to practise Prāṇāyāma even in walking,²⁸ and yet not to go against the traditional rules of Prāṇāyāma, that we have arranged to give in this part of the present handbook, the technique of Ujjāyī. This is the only type of Prāṇāyāma allowed by the Yoga Sāstra to be practised even while one walks. It is principally for this reason that we teach Ujjāyī to every man that comes to us for a Yogic instruction, be it for his body or for his mind.

The Posture

If the physical culturist prefers to practise Prāṇāyāma while walking, no question of posture arises with him. Again if he chooses to have the practise of Prāṇāyāma in a standing position, the question of Āsana is of no consequence to him. He should,

27. We cannot much appreciate the advice given to their followers by particular physical culturist, to practise Prāṇāyāma while taking violent muscular exercise. So far as we understand the physiological aspects of both Prāṇāyāma and violent muscular work, we have no hesitation in saying that it is impossible to practise Prāṇāyāma while violent muscular work is being done. One may hold his breath for a time during such a work and give it the dignified name of Prāṇāyāma or Kumbhaka but any attempt to claim Prāṇāyāmic advantage for such a holding of breath, is as unscientific as it is misleading.

28. गच्छता तिष्ठता कार्यम् । उज्जाय्याख्यं तु कुम्भकम् ॥ Haṭha Pradīpikā, 1152 (The Ujjāyī Prāṇāyāma may be practised even while standing or while walking.)

however, stand erect and rest his hands on his iliac bones.²⁹ (Vide Fig. 24). So also if a physical culturist thinks of going through the Prāṇāyāmic exercises while sitting, he should assume as erect posture³⁰ and rest his hands on his knees. It is not necessary for him to assume any of the Yogic postures. The spiritual culturist shall always sit in one of the meditative poses described in the last chapter. The importance of Āsana in the process of his evolution, can never be exaggerated. The principal meditative poses are Siddha, Padma, Svanstika and Sama. Of these we should specially recommend to our reader the first and the third. Both these Āsana have a special spiritual value.

Mudrā

Spiritual culturists will do well to note in short the technique of what is known as Jñāna-Mudrā, the *symbol of Knowledge*.

29. For a full discussion on the physiological significance of the technique of Prāṇāyāma we strongly recommend our articles in *Yoga-Mīmāṃsā* to our readers. However, a few points have been made clear in this handbook in the foot-notes. It may be said that every point in the technique has its own scientific importance and should be carefully attended to.

30. Our article on the meditative poses appearing in *Yoga-Mīmāṃsā*, Vol. III, explains the hygienic value of an erect posture. The article is intended for the physical culturist as well as the spiritual culturist. However, those students who want more scientific studies values of postures are referred to pages 34 to 49 of *Yogic Therapy* written conjointly by the present author, and Dr. S.L. Vinekar and published by the Central Health Ministry, New Delhi.

This Mudrā is practised as an accompaniment of a meditative pose. The palms are fully stretched out and the tip of the index finger, that is, finger next to the thumb, is made to touch the tip of the thumb of the same hand. In this action, it is the forefinger that is bent to meet the thumb, the latter advancing a little, no doubt, to meet its fellow. Fig. 25 illustrates this Jñāna-Mudrā by itself, whereas Figs. 21 and 23 illustrate the same when practised as a part of Svastikāsana and Samāsana respectively.

Bandha

The different Bandhas, namely, Uḍḍiāna, Jālandhra and Mūla, that play a prominent part in the practice of Prāṇāyāma have already been described in the last chapter. Under no circumstances should Kumbhaka be practised without Jālandhra Bandha. The practice of the other two Bandhas is optional.³¹

Time

For a physical culturist any time half an hour before the meal, of four hours and a half after a full meal is available. Light refreshment does not preclude the practice of Prāṇāyāma after some two hours.

A spiritual culturist should practise Prāṇāyāma twice a day, that is, morning and evening to begin with. As he advances he may take advantages of the midday and ultimately of midnight.

31. The practice of Kumbhaka with the simultaneous exercise of all the three Bandhas is *highly dangerous*, if done without proper care and caution. No student of Yoga should indulge in this exercise without the help of an expert.

Every time he must see that he has a thoroughly light stomach before he starts his Prāṇāyāma. His meals must always be moderate. One meal plan is the best for him. He must allow some six hours between his last meal and his exercises. Even after taking a moderate quantity of milk, he must not take to his practice at least for two hours.

In the morning the exercise of Prāṇāyāma should be tried after the cleansing processes of Dhauti, Basti etc., and even after the Āsanas. In the evening Prāṇāyāma should come after the Āsanas.³² if any meditation is being practised, Prāṇāyāma should precede it.

The conclusion

In concluding this short chapter on Prāṇāyāma, we have to point out to our reader that the subject is very vast and requires volumes of information for its full treatment. These notes are intended for enabling the reader to follow the technique of the different types of Prāṇāyāma intelligently, and also to help him in his Yogic practices. Prāṇāyāma is by far the most useful exercise for a physical culturist. To the spiritual culturist its importance is supreme. We are trying our best to supply scientific information to both these classes of readers in the volumes of Yoga-Mīmāṃsā

We earnestly request our readers never to allow their enthusiasm to get the better of reason. Prāṇāyāma is a weapon

32. Here we have simply indicated the sequence of the different Yogic practices. We do not mean that the other practices must necessarily be gone through before one takes to Prāṇāyāma.

that easily lends itself to abuse. In playing with Prāṇāyāma, a man plays with his nerves, heart and lungs. Undue strain or imperfect methods in Prāṇāyāma may damage these parts permanently. So every one should proceed into this practice with due caution and care. When this is done and when our instructions are attentively and faithfully followed, Prāṇāyāma is perfectly safe. When rightly done, Prāṇāyāma will never fail to ensure supreme vitality for the body and eternal peace for the mind.