

## A RETROSPECTIVE ON YOGA RESEARCH

Thirty years ago, four landmark papers were published from the All India Institute of Medical Sciences (AIIMS) on some physiological aspects of yogic practices (1, 2, 3, 4). In order to bring some of the thrill of those studies to the readers, the Editors requested the pioneers, Dr. B.K. Anand, Dr. G.S. Chhina and Dr. Baldev Singh, for an interview (Fig. 1). During the interview, they recalled the origin of the studies, highlighted the human side of the interactions between scientists and yogis, and offered some useful advice for future work on yoga. This issue also carries an article by Dr. B.K. Anand which synthesizes our understanding of the relationship of yoga to the body, mind and consciousness (5).



Fig. 1 : The pioneers. From left to right: Prof. B. K. Anand, Prof. Baldev Singh and Prof. G.S. Chhina.

The stimulus for those studies came from some questions then raised in the Parliament about the paucity of research on yoga. These very pertinent

questions percolated from the Parliament to the Indian Council of Medical Research (ICMR), and from the ICMR to the Department of Physiology at AIIMS. However, once the scientists made up their minds about working on yoga, getting the yogis was not easy. The highly accomplished yogis shun any form of publicity or exhibitionism. Further, the attitudes of yogis and scientists are, in some respects, contradictory. While yogis look within themselves in search of truth, scientists look for verifiable facts in the external world. Added to this genuine difference in outlook is a lurking mutual suspicion about the abilities and claims of each other. The most helpful arguments for persuading the yogis to cooperate were that the research would tell the world something about yoga in a language which the modern man understands, and that the research by renowned scientists at a renowned institution would provide a seal of recognition and approval to yoga; in short, that the research would further the cause of yoga. These arguments had to be conveyed in suitably subtle ways to the yogis through their disciples.

Yoga is a system of physical and mental discipline, and its votaries constitute a continuous spectrum from beginners and charlatans to highly accomplished yogis. Hence, research on yoga can be also highly varied. The work done at AIIMS 30 years ago was mainly on the meditative yogic practices. But plenty of work relevant to metabolism, endocrinology, kinesiology and health sciences can be done on other aspects of yoga as well. But any work on yoga is a full time commitment since it also involves field work. The best work on yoga is possible only if the investigator himself learns and, preferably, observes yogic discipline.

### REFERENCES

1. Anand BK, Chhina GS. Investigations on yogis claiming to stop their heart beats. *Ind J Med Res* 1961; 49: 90-94.
2. Anand BK, Chhina GS, Singh B. Studies on Shri Ramanand Yogi during his stay in an air-tight box. *Ind J Med Res* 1961; 49: 82-89.
3. Anand BK, Chhina GS, Singh B. Some aspects of electroencephalographic studies in yogis. *Electroenceph Clin Neurophysiol* 1961; 13: 452-56.
4. Wenger MA, Bagchi BK, Anand BK. Experiments in India on "Voluntary" control of the heart and pulse. *Circulation* 1961; 24: 1319-25.
5. Anand BK. Yoga and medical sciences. *Indian J Physiol Pharmacol* 1991; 35:

*On the next few pages, we have reproduced some material from the four papers published in 1961, for which we are grateful to the authors and the original publishers.*

*Electroenceph. clin. Neurophysiol.*, 1961, 13: 452-456.

## SOME ASPECTS OF ELECTROENCEPHALOGRAPHIC STUDIES IN YOGIS<sup>1</sup>

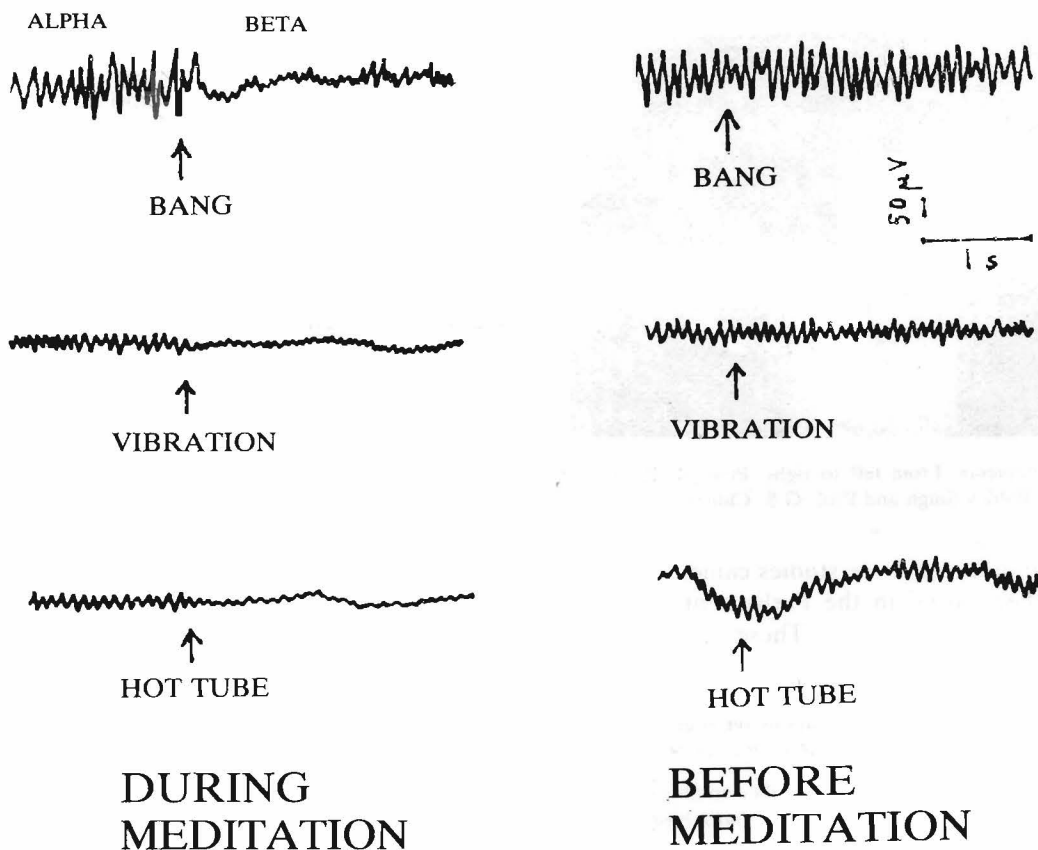
B. K. ANAND, G. S. CHHINA AND BALDEV SINGH<sup>2</sup>

*Physiology Department, All-India Institute of Medical Sciences, New Delhi (India)*

### SUMMARY

Four Yogis who practised *samadhi* were investigated electroencephalographically. It was observed that their resting records showed persistent alpha activity with increased amplitude modulation during *samadhi*. The alpha activity could not be blocked by various sensory stimuli during meditation.

Two Yogis, who could keep their hand immersed in ice cold water for 45-55 min, also showed persistent alpha activity both before and during this practice.



Monopolar EEG scalp recordings of Shri Ramanand before meditation and during meditation. Photic, vibration, auditory, and thermal stimuli block the alpha rhythm when he is not in meditation. No blockage of the alpha rhythm occurs when he is in meditation. Recordings of only the Right Occipital lead have been shown. Modified from Fig. 3 of the original.

*Ind. Jour. Med. Res.*, 49, 1, January, 1961.

## STUDIES ON SHRI RAMANAND YOGI DURING HIS STAY IN AN AIR-TIGHT BOX\*.

B. K. ANAND, G. S. CHHINA, AND BALDEV SINGH.

*(From the Department of Physiology, All-India Institute of Medical Sciences,  
New Delhi.)*

### SUMMARY.

1. Shri Ramanand Yogi was studied in an air-tight sealed box on two occasions, first time for 8 hours and second time for 10 hours.

2. His average oxygen utilization during the whole of this period was reduced to about 13.3 liters hour, while his 'basal' requirement was 19.5 liters/hour. The oxygen intake was higher than basal in the first hour, while during the remaining hours it was much lower than basal. In the middle period it was approximately as low as 10 liters/hour.

3. The carbon dioxide output also behaved in a similar manner.

4. Even when breathing air the oxygen content of which had decreased and carbon dioxide content increased, he did not show any hyperpnoea or tachycardia.

5. The EEG mostly showed low voltage fast activity resembling early stages of sleep.

*Ind. Jour. Med. Res.*, 49, 1, January, 1961.

## INVESTIGATIONS ON YOGIS CLAIMING TO STOP THEIR HEART BEATS\*

B. K. ANAND, AND G. S. CHHINA.

*(From the Department of Physiology, All-India Institute of  
Medical Sciences, New Delhi.)*

### DISCUSSION.

These experiments show that in the three individuals studied, there was no voluntary control over their hearts' activities. They could not stop or influence their heart beats, on the other hand they greatly decreased the cardiac output by decreasing the venous return to the heart. This was achieved by raising the intrathoracic pressure by taking a deep inspiration or expiration followed by closure of the glottis and contraction of the chest and abdominal muscles.

## Experiments in India on "Voluntary" Control of the Heart and Pulse

By M. A. WENGER, PH.D., B. K. BAGCHI, PH.D., AND B. K. ANAND, M.D.

### Summary and Conclusions

Among other studies in India the authors investigated four practitioners of Yoga in respect to control of the heart and pulse. Two claimed to stop the heart. One formerly made this claim but only demonstrated his method. The fourth claimed only to slow the heart.

The method for the first three was similar, involving retention of breath and considerable muscular tension in the abdomen and thorax, with closed glottis. It was concluded that venous return to the heart was retarded but that the heart was not stopped, although heart and radial pulse sounds weakened or disappeared.

The fourth subject, with different intervening mechanisms also presumably under striated muscle control, did markedly slow his heart. The data indicate strong increase in vagal tone of unknown origin.

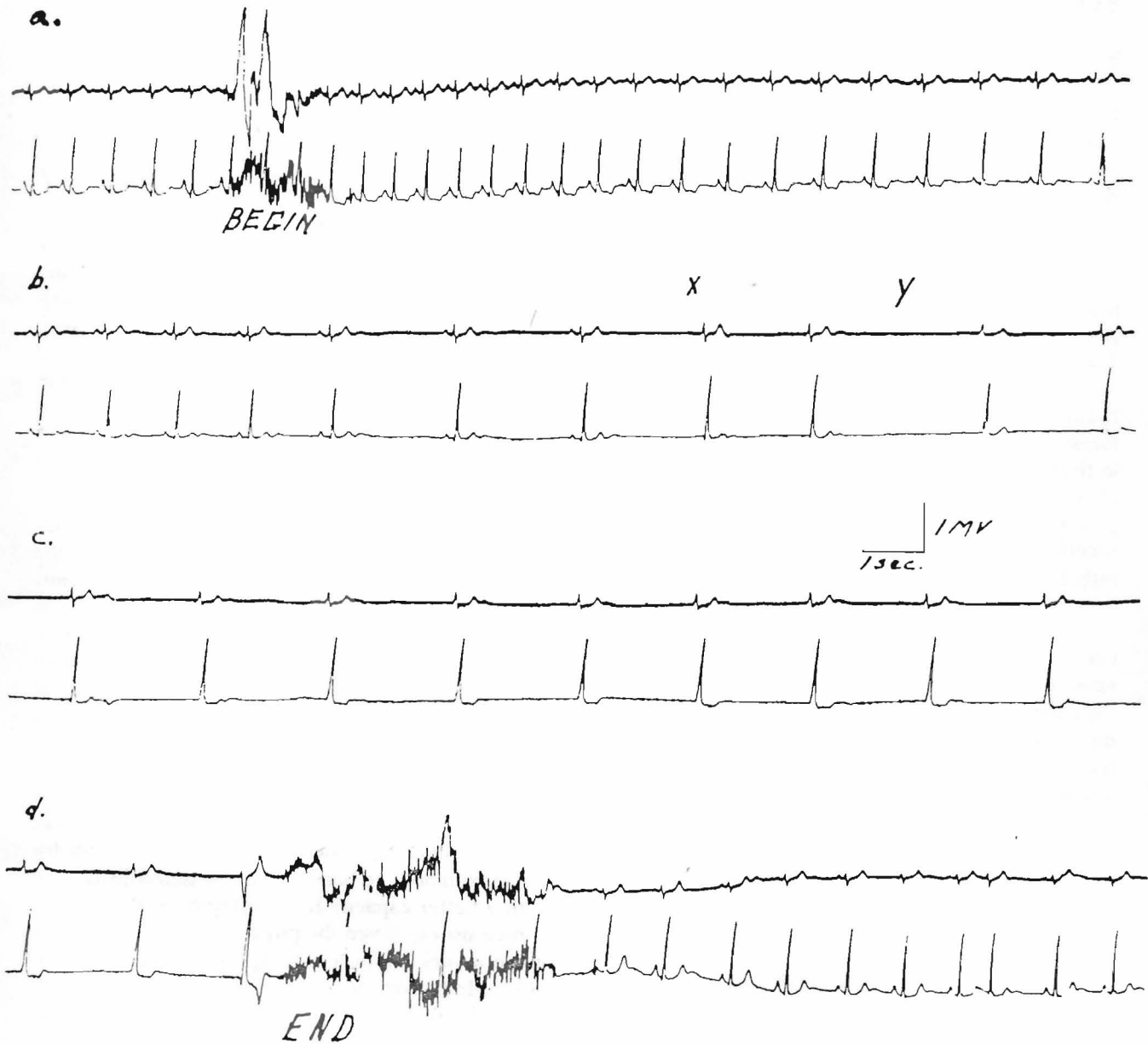


Figure 3

One attempt by Shri Upadhyaya to slow the heart. Sequential portions of the recording of electrocardiographic leads I and III are shown. Calibration was 1 mv/cm. Chart speed was 1.25 cm./sec. The P wave disappeared (x) and was absent for 16 heart cycles. The longest cycle length (Y) was almost 3 seconds.

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