



Report of the Committee on Research in Ayurveda.

BOMBAY

PRINTED AT THE GOVERNMENT PRESS

Obtainable from the Superintendent,
Bombay, or through the High Commissioner,
Aldwych, London. W.C. 2.

CONTENTS

	PAGE
CHAPTER I—Introduction	1
CHAPTER II—Historical	3
CHAPTER III—The Necessity of Research : (1) Review of Questionnaire, (2) Justification of Research	5
CHAPTER IV— Our View Point : (1) The Aims of Research, (2) The Subjects of Research, (3) Literature Study, (4) Psychological Studies, (5) The Doctrines of Ayurveda, (6) Clinical Research also in Shalya, Shalakya etc., (7) Research in Dravya-Guna-Rasa etc. Research on Pardartha-Vidnyan, Rasa-Shastra, Agad-Tantra, (8) Research in Dietetics, and (9) Research in Pharmaceutics	10
CHAPTER V—Cognate Problems : (1) Standardization, (2) Compilation of a Pharmacopoeia, (3) Text-Books, (4) the Study of Health and Hygiene	17
CHAPTER VI—The Organization of Research : (1) The Search for Researchers, (2) The Research Board, (3) Roundtable Conferences, (4) Co-operation of Institutes and other Scientists	19
CHAPTER VII—Scheme of Research	21
CHAPTER VIII—Short and Long Term Policies	32
CHAPTER IX—Financial Implications	34
CHAPTER X—Recommendations	35
APPENDIX—The Questionnaire	37

REPORT OF THE COMMITTEE ON RESEARCH IN AYURVEDA

CHAPTER I

INTRODUCTION

1. The Government of Bombay by their Resolution in the Health and Local Government Department, No. 6238/33, dated 29th March 1949, appointed a Committee consisting of the following persons, to consider questions relating to Research in Ayurveda :—

- (1) Dr. K. S. Mhaskar, M.A., M.D., D.P.H. (Chairman).
- (2) Acharya Jadavji Tricumji.
- (3) Dr. B. B. Yodh, M.B. (Bom.), M.R.C.P. (Lond.), D.T.M. & H. (Eng.).
- (4) Vaidya Krishnashastri Kavade, B.A. Pranacharya.
- (5) Vaidya B. V. Gokhale, Ayurvediya-Parangat.

2. The terms to the Committee were as follows:—

“In the light of the observation contained in Paragraphs 104 and 105, on pages 32 and 33 of the Report of the Indian systems of Medicines Enquiry Committee, Bombay, 1947-1948 and other relevant considerations :—

(i) To lay down the general principles on which Research in Ayurvedic Medicine should be conducted ;

(ii) To frame a long term programme for such Research work, extending over a period of 10 to 25 years, if necessary ;

(iii) To recommend an Institution or Institutions, at which such research work should be carried out ;

(iv) To make recommendations regarding provision of necessary funds ;

(v) To consider the schemes of research, if any, prepared and submitted to the Committee, by any of the existing institution and to make recommendations for any of these schemes which should be put through independently of the general programme for research work ;

(vi) To consider any other cognate questions relating to research in Ayurvedic medicine.

3. The Committee had been asked to submit its report to Government by the 31st December 1949 ; but as the replies to the questionnaire issued by the Committee continued dribbling in, to the end of November 1949, the Committee asked for an extension period of two months, which was granted by Government in their Resolution No. 6238/33, dated 23rd December 1949.

4. The Committee recommended the appointment of Dr. Sohrab A. E. Hakim, M.B.B.S., as Hon. Secretary to the Committee on Research in Ayurveda, which Government approved in their letter No. 6238/33-4, dated 7th May 1949.

5. *The Questionnaire.*—The Committee issued a Questionnaire on 12th May 1949 and requested replies *within a month of receipt*, in any language the writer chose viz: English, Hindi, Marathi, Gujrati or Kanarese (*See Appendix*). Many of them asked for time to think the questionnaire over, which had to be granted on account of the India-wide importance of the subject and responsibility of the task.

The total number of Questionnaire sent out in the above languages was 896 ; of which 27 were sent to Institutions, 201 to individual doctors of University, or of Colleges of Physicians qualifications, 117 to Doctors of Science and Literature, and 474 to Ayurvedic practitioners, 24 to Unani Hakims and 53 to interested individuals, situated mostly in Bombay State.

The total number of replies received were 81 of which 56 were from Ayurvedic Practitioners, 17 from individual doctors, and 8 from others. The above include 21 replies from representatives of Ayurvedic Institutes, and 7 Schemes of Research. There were 5 other schemes of Research. Several letters, Booklets etc. had also been received.

Of these again 44 were in English, 23 in Marathi, 8 in Gujrati, 3 in Hindi, 2 in Kanarese and 1 in Sanskrit. Each one has been allotted a code number which is used in the text.

6. *Meetings.*—The Committee members met officially eleven times ; but they met unofficially from time to time to exchange views regarding the procedure to be adopted and approval of action taken.

7. *Visits.*—Many of our colleagues had first-hand knowledge of the Ayurvedic and other institutions in this Province. Two of us, who had not seen the Jamnagar Institution, availed themselves of the opportunity offered by Dr. Pranjivan Mehta, the Saurashtra State Medical Officer, and are grateful to that Government and to Dr. Mehta for the facilities given to us at their Institute.

8. *Thanks.*—We are glad to express our grateful thanks to those who have helped us in our work, including those who sent replies with such painstaking efforts to our Questionnaire and gave informative explanations. We are also grateful to the staff of the Institutions we visited, and to all others who helped us in many other ways.

CHAPTER II

HISTORICAL.

9. *Previous efforts.*—The Chemical examination of many of the Ayurvedic plants and minerals as also the botanical classification of plants has been carried out in various parts of India and some of these have also been examined pharmacologically as well.

Valuable works like Charak Sanhita, Sushruta Sanhita, Ashtang-hridaya, Kashyapa Sanhita, Rasa-hridaya Tantra, Pratyaksha Sharir, Ophthalmology etc., have been examined from the literary point of view by several eminent Ayurvedists and been published by them. Plants mentioned in Sushruta and Brih-trayi have already been listed. Rasa-Yoga Sagar recently published by Pandit Hariprapannaji is considered very useful.

The Researches carried out in Ayurveda so far, have been independent efforts with a limited objective in view and are, therefore, not quite exhaustive for the elucidation of Ayurvedic Doctrines. It is absolutely necessary, therefore, to undertake further research on a co-ordinated basis and with a definite point of view.

10. The case for this research has also been well made out in Vol. 1, of the Report of the Committee on Indigenous Systems of Medicine (commonly known as the Chopra Committee) and published by the Ministry of Health, Government of India, 1948.

11. In summarising their arguments in paras. 293-294 of the Report, the Chopra Committee mentioned that it is now necessary to apply scientific methods, for Research in Ayurvedic Medicine and recommended research on the following :—

- (a) Literature ;
- (b) The Doctrines of Ayurveda ;
- (c) Clinical observations in Diagnosis and Treatment ;
- (d) Pharmacology and Therapeutics ;
- (e) Dietetics ;
- (f) Psychology in Ayurveda ;

12. The Chopra Committee opined that (a) the available literature on Ayurveda is very scattered. Some of the original one is lost and some mutilated in transcribing. Authoritative versions of these ancient texts, would, therefore, have to be carefully edited and published.

(b) Comparative Clinical Research would be one of the most fruitful lines of approach for the clarification of the principles and methods of diagnosis and treatment of diseases.

(c) The pharmacological properties and therapeutic values of many remedies should be fully investigated.

(d) Research should be undertaken in "Dietetics" in health and disease, and its influence on "body and mind", as explained in Ayurveda.

CHAPTER III

THE NECESSITY OF RESEARCH

13. *Review of the Questionnaire.*—The Questionnaire had been drawn up with a view :—

- (1) To understand Ayurveda in its true perspective ;
- (2) To remove the superfluities and the inconsistencies in it ;
- (3) To bring it in alignment with modern methods of writing literary works and to make it understandable to the students ;
- (4) To make the aphorisms more comprehensible and definite ;
- (5) To find out whether what is metaphysical in it, can be brought down to the physical plane ;
- (6) To explain in quantitative terms the relations of cause and effect (Tridosha) ;
- (7) To remove the apparent irrelevancies in etiology in pathology and in therapeutics of disease ;
- (8) To find out a common basis, if any such existed, for all medical systems in order to consider a possible *synthesis* of them all ;
- (9) To find out the nature of help that can be rendered by outside but allied systems of medicines and by scientists, in the elucidation of the above, and
- (10) To discover where and by whom such a Research in its manifold aspects could most usefully, economically and harmoniously be carried out.

Some of the questions have been answered in the Ayurvedic literature itself and all that many of our esteemed collaborators to whom the Questionnaire had been sent, had to do, was to cull appropriate extracts from eminent ancient works and give renderings of the same with more or less explanations. We desired, however, to find out the current trend of thought and to learn the necessities of the present times.

Questions Nos. 1, 2, 3, 9, 11, 12, 13, 14, 15, 16, 17 and 18 are of this nature viz. : *to find the lines of Research.*

Questions Nos. 4, 5, 8 and 20 are with reference to practicability and financial aspect of Research.

Questions Nos. 6, 7, 10 and 19 are with a view to elicit the nature of outside help that may be sought.

14. *Justification of the Necessity of Research.*—The answers to the Questionnaire vary from one extreme to another, while some express themselves strongly on the futility of such investigations as a waste of public money and misuse of intellectual

energy, the others express themselves just as emphatically that Ayurveda is a perfect science and has nothing to learn from any system in the world,—the imperfections seen in it being those of want of understanding, rather than from intrinsic defects.

The former group also feels that :—

(1) Western medicine has nothing to learn from Ayurveda, which though at one time in ancient days served the public well and usefully, yet with the rapid and advanced methods of diagnosis and treatment, Western medicine is more appropriate to the needs of the present day and is in alignment with progress in medical and other sciences in the world ;

(2) Ayurveda lacks advanced methods of control of epidemics, of prevention and of rapid cure in acute diseases. In the treatment of some chronic diseases, it probably has a place.

(3) It unnecessarily prolongs the period of sickness and is, therefore, uneconomical in the long run.

(4) Drugs like Paludrine, Sulfa Drugs, new Arsenic compounds, Pennicilin, Strepto-mycin, Chloromycin, Auromycin, Liver preparations, etc., which attack the cause of disease should be used whenever they are indicated in lieu of Ayurvedic drugs in order to effect rapid cure and save time and life.

(5) Ayurvedic treatments are just as expensive as those of the West, and well tried Western medicines can hereafter be manufactured in the Indian Republic on a mass scale, at a still cheaper rate.

15. *The Ayurvedists retort with the statements that :—*

(1) Western medicine has expanded primarily in surgery and obstetrics only from the art point of view. Ayurveda is many times superior to Western medicine when the mutual relations between cause and effect are to be demonstrated in matters of basic doctrines, origin of diseases and their prevention ;

(2) Epidemic diseases have been described in detail in such ancient works as that of Charak. The discussion of causes of diseases, of prevention of infectious diseases, of purification of places, of air, water and diet, can be found in several Ayurvedic works ;

(3) Although Ayurvedic medicines are administered essentially by way of the mouth or rectum, they are quite as effective as the injections of Western medicines as can be illustrated by potent medicines like Hema-garbha, Samirpannaga, Makar-dhwaja, etc. If such drugs are investigated in the laboratory and in the hospitals, it is possible that the

Ayurvedic aspect of drugs and their properties would again come to the fore and Siddha medicines in Ayurveda would be more helpful in preventing and curing diseases. The spread of Ayurvedic ideas of hygiene would prove exceedingly useful in the prevention of diseases ;

(4) What is described in Western medicine as "Rapid cure of disease" is only a suppression of disease for the time being and is not, therefore, beneficial to the patient. As the cause of disease is not eradicated completely, the disease is likely to recur again in one form or another ; for this reason, though the treatment is rapidly effective and costs less, still, it ultimately proves harmful and more expensive. Such treatments have been clearly condemned in Ayurveda ;

(5) Sulfa-drugs, strepto-mycin, etc. appear to control the symptoms for the time being, but do not cure the disease completely. The patient is affected adversely on account of the toxic effects of these drugs and he becomes susceptible and falls an easy prey to many other diseases. Anaemia, neuritis, neurasthenia, heart-failure, meningitis, collapse, abscess of lungs, etc. are some of the new diseases that appear on account of this susceptibility. Western medicines, which were considered useful at one time, are being condemned after fresh trials and new medicines are being boosted in their place.

Ayurvedic medicines, if investigated, will be found to be effective and harmless.

Leaving out the question of certain remedies, it can generally be asserted that Ayurvedic medicines and treatments are more beneficial, because of their cheapness and their indigenous nature.

16. Intermediate opinions are found, where Ayurvedists admit the deficiencies of Ayurveda in matters of Surgery, Midwifery, Gynaecology, Ophthalmology, Bacteriology, etc. and recommend the enrichment of Ayurveda accordingly. Some others say that such half-hearted measures, satisfy neither the Ayurvedists nor the patients whom they treat.

17. There is further a *Fourth group* of persons, who contend that since all Systems of Medicine aim at prevention and cure of diseases, there must be points of contact between the various systems which can help to evolve a *Synthetic System* which would be safe and sure, and yet cheap enough to meet the needs of rural India. This can also help to eliminate the variety of practitioners working for the same cause and avoid much overlapping. According to this group, research is necessary to discover such effective points of contact, simplify medical treatment and reduce its costs, by taking the best out of every system.

18. The replies to the Questionnaire, therefore, do not bring out any new points, but enforce the ones that have already been in the fore-front for ever so many years and also in the previous reports, according to each one's bent of mind.

The balance of evidence, however, indicates that Ayurvedists desire Research in order to find out the extent of Ayurveda and its depth, eliminate, if possible, the mutilations that have crept in and bring order into the apparent chaos of literature, so as to make it comprehensible to the poorest of intellect and the student; old processes of treatment even operations, should be revived if there be merit in them; pharmaceuticals should be standardised to prevent adulteration and to encourage mass-production of drugs and preparations at a cheaper rate.

19. *Other Justifications for Research.*—(a) In the lives of very many of us, there have undoubtedly been instances where astonishing cures have been seen and which cannot be attributed to any other factor, but the medicine applied or administered, be it a herb, or a concoction, or otherwise.

If this be the experience of those of us, who can weigh arguments and separate the dross from the gold, one can easily imagine the feelings of the non-medical public, both literate and illiterate, who, prepared as they are to forget and forgive the negative results, are easily swayed by the positive.

Such instances make one pause and think, and demand an explanation, and when these are further reinforced by a line of thought and argument, the conviction about their merit and the thirst for research grows stronger still.

(b) Western medicine and its allied sciences are gradually passing from the Physical to the Metaphysical and admit that "body and mind" are not two separate entities, but influence each other intimately. Gastric ulcer is pointed out as an instance of how a pathological mind demonstrates itself completely by physical symptoms and how some of the insanities or mental derangements, are an expression of some physical but undemonstrable injury to the brain.

(c) Even the Western conception of the working of the human body is still incomplete and is at present believed to be the result of the interactions of *one internal milieu*, the medium inside the body, and *the external milieu* which surrounds the body. It is this internal milieu in which all the living cells of the body are continually immersed and draw from it any kind of nourishment they desire, be it hormone, salt, vitamine, protein, oxygen, etc. This is the end point of Western Materialism and the starting point of the Eastern. If the Ayurvedists had observed to begin with, such Unity of Purpose, had proceeded from the consideration of the Infinite

to the Finite, believed it to be of three parts—the three Gunas—Satva, Raja, Tama, and evolved out of it their theory of Health and Disease and the approach to the cure of diseases, in a meditational and observational way, there ought to be little for many of the Western medical scientists to wonder at, for, whether it be by induction or deduction, the starting point of health and its variations happens to be the same.

Such points of contact in Ayurveda, which might be considered *post-hoc*, can be multiplied to provide a mass of evidence for the necessity of investigation of still unverified statements in Ayurveda on their intrinsic merits alone.

CHAPTER IV

OUR VIEW POINT

20. *The Aims of Research in Ayurveda.*—The present day aims and objects of research in Ayurveda are not entirely the Synthesis of the various medical systems of medicine, nor entirely the finding out of what could be demonstrable in the hospital and in the laboratory; but also to find out how Ayurveda can be utilised for the increase of quantum of Health in man and to ameliorate or eradicate the departures from this health. The aim is high enough to reveal a common Platform of Utility for every System of Medicine.

21. *The Subjects of Research.*—

It is necessary for this purpose to investigate Research Problems in Ayurveda from 6 points of view as given below:—

- (1) Study of Ayurvedic Literature;
- (2) Study of Psychology as propounded in Ayurveda;
- (3) Study of the Doctrines of Ayurveda;
- (4) Clinical studies in Diagnosis and Treatment as described in Ayurvedic texts;
- (5) Pharmaceutic, Pharmacologic and Therapeutic study of Drugs;
- (6) Study of Dietetics as described in Ayurvedic texts.

22. *Literature Study.*—Historical evidence ranks supreme in any research, as it is practically the guide-post for every research. Even conflicting evidences have a value of their own, as often enough, an answer can be found in such conflicting views and “order” brought about in the apparent “disorder in literature”.

Such evidence about Ayurvedic philosophy and allied doctrines lies scattered far and wide, requiring experts with a definite angle of vision to cull it out. Philological studies also, often reveal distant connections of thought.

The order of research as made out by the Chopra Committee is given on page 3. We appreciate the order but would like to give precedence to Research in the texts of Sankhya, Yoga, Vaisheshika and other Darshanas, for these are the foundations on which Ayurveda is largely built up.

The study of past literatures e.g. Vedic literature, Mahabharat, Puranas, Dharmashastras, Smritis, Grihya-Sutras, Darshanas, Arthashastras, etc. for obtaining historical evidence is just as laborious and learned a task, as that in the laboratory and, though time-consuming, will narrow down and define the field of future laboratory and clinical research. Such a research might even contribute a substantial quota to the philosophical knowledge of the world and give a correct perspective of what “Health” consists in. No one yet knows what “Health” is

and the wide field it pervades in the regions of the Body, the Mind, the Intellect and the Spirit. Western medicine thinks still too closely and within narrow grooves in the field of the Body and its diseases, and is just beginning to perceive that Mind is just as much a part of the body, as Body is that of the mind; but the Spirit pervades them all and sometimes stands out prominently above the rest.

It is with this kind of philosophy, both theoretical and practical, that ancient Indian literature dealt in and hence its supreme importance as part of historical evidence. Laboratory Research as understood in the present day was never perhaps resorted to, in those days. Owing to the absence of relevant literature, it is not possible to surmise the methods they used in arriving at their conclusions.

23. *Psychological Studies*.—Even the study of books by eminent philosophers of the West, shows how every decade of their literary life is permeated by the ever-widening horizon of their vision and their insight into "things unknown", proving thus, how deep thinking and meditation led them imperceptibly to the statements found in India's ancient literature. The lives of Kant, Hegel, Shakespeare, Max-Muller, Shaw, Einstein, Sir (Dr.) William Osler, Dr. Freud, Sir (Dr.) Thomas Barlow, etc. illustrate this common observation. "Meditation and Intuition" mentioned by Ayurvedists as a necessary means of research, may thus be proved to be truly logical and the result of deep thinking, in which the cognizance of intermediate processes of thought, is lost. The study of contemporary Indian literature of the period, might reveal these missing processes, in what at present look superficially as "mental vapourings".

The Electro-Encephalo-Gram method of the West has rendered possible the converting of thought-processes to a graphic form. The Lancet (Nov. 26, 1949, page 957) mentions in its editorial :—

"The time has now come when both Philosophy and Medicine are likely to benefit from a thorough and critical consideration by Philosophers, especially perhaps those of the logical positivist school, of the facts established by Electro-Encephalo-Gram and similar investigations."

24. *The Doctrine of Ayurveda*.—Ayurveda is based on three principal and fundamental doctrines,—(1) The Panchamahabhut, (2) the Tridosha and (3) the Dravya-Guna-Rasa-Vipaka-Veerya-Prabhav. It appears difficult at present to investigate the truth of these doctrines by Meditational or Intuitional ways. It also appears difficult, to obtain for their elucidation, scientific evidence of the modern type. What can be done immediately, however, is to get them examined against their philosophical, logical and clinical back-ground, from both the Eastern and Western points of view and to see how far this verification can

substantiate or help to understand the three Doctrines of Ayurveda. It is a matter for experts, versed in the knowledge of Ayurvedic Doctrines and Practice and of the philosophical literature of those periods. Such an exposition will add more weightage to the doctrines in view and be an exhaustive study of the same.

Tridosha theory became discredited in the latter part of the 19th century, along with the Humoral theory of the ancient West. Though life and its processes were little understood, modern developments in anatomy, biology and physiology gave high precedence to the brain, and the nervous system, as the centre of all energising processes, which demonstrate Life. While the Humoral theory of the West had perhaps little philosophical background, the Tridosha theory of Ayurveda was the result of close study and derived its authority from an equally respectable philosophical theory, that of the Pancha-Mahabhuta, the all pervading principles of life. The Panch-Mahabhutas, according to the Ayurveda, are not only evident in human beings, but also wherever life and matters existed.

After due consideration, we feel that the following interpretation of the three Doshas should be accepted as a working hypothesis :—

According to Ayurveda, the Tridoshas are believed to be the three bodily entities performing three kinds of functions. That bodily entity which causes all bodily activities, sensations and achievement, is named *Vata*. The bodily entity that regulates heat and digestion, is called *Pitta* and that bodily entity which helps the bodily parts to adhere together and helps to nourish the body is termed *Kapha*.

If the Tridosha theory is proved to have a scientific basis, it follows clearly enough that deficiency or excess in any of the Doshas would cause an unbalance, which can return to normality by supplying the deficiency or removing the excess. All Panch-bhautic things possessing as they do the virtue of increasing or lessening the Doshas, would thus lend themselves admirably to suit the needs of Human Health balance. This is one of the reasons of the help, the study of Tridosha would render to the clinical, pharmacological and therapeutic investigations.

It is absolutely essential to devise methods that can indicate the presence or absence of any of these Doshas qualitatively. Accurate diagnosis would further require a quantitative estimation of the same. Blood-examination, in all its aspects, has been suggested by some as one of the methods of elucidating the presence and quality of these Doshas. Patients suffering from well-defined and gross derangements of the Doshas might prove useful subjects of study in the beginning, in a Bio-Chemical Laboratory. Should the blood examination not lead

to a conclusive result, it cannot discredit the original Tridosh theory, but can only show that this approach is unsuitable.

We are glad to find from the answers, therefore, that Ayurvedic physicians agree that the help of physiology and pathology is needed for elucidating the Tridosh theory and for obtaining definite ideas of the same, to illustrate their conception of "excess or deficiency" of a Dosh, with physiological, clinical and pathological evidence so as to enable them to express the Doshas in quantitative terms, if possible.

25. *Clinical Research.*—The idea of "Disease" in Ayurveda is explained in Ayurvedic terms, as also the method of approach to these diseases in fixing their Nidana (diagnosis). A co-ordinated study is necessary to discover any common ground in the study of diseases so as to understand clearly the theories and methods of approach as described in Ayurveda.

This can best be carried out, in what would be termed chronic complaints or diseases, such as chronic diseases of the brain, the heart, high blood-pressure, kidneys, intestine, liver, spleen, rheumatic diseases, stones in kidney and gall bladder, supposed incurable malignant diseases, piles, tumours, chronic ulcers, intractable diarrhoeas and dysenteries, constipation, etc. which can be studied to mutual advantage of the several systems of medicine and benefit of mankind. Similar studies should also be carried out in such acute diseases e.g. Malaria, Typhoid, Syphilis, Plague, Gonorrhoea, Pneumonia etc. if, the Ayurvedic physicians consider it necessary.

The Shalya (Surgery), Shalakya (Ophthalmology), Prasuti-Tantra (Obstetrics), Bala-Roga (Pediatrics) have during the last few decades been crowded out of Ayurveda in their entirety by Western methods which are very much to the fore. Leaving aside for the present, the views of Ayurveda in the instrumental and manual aid required in the above subjects, it is but just that the sections on medical treatments, involved in the above, should receive proper investigation along with the rest.

A co-ordinated study of clinical cases in the Hospital regarding symptomatology, treatment and reactions to treatment, is necessary day by day until the case is cured or is pronounced incurable. *The Pancha-karmas*, so highly extolled for their benefits require to be studied and verified on scientific lines.

The method should be worked out thus :—In a group of cases the Ayurvedist should be in charge of the case, take the active lead both in diagnosis and treatment, and the medical men trained in Western methods should make every sort of examination, observe every day the changes that occur and the results obtained by a particular line of Ayurvedic treatment and the argument behind it. In another group of similar cases the Ayurvedist should watch, observe and note the changes he

finds day by day, while the case is under the care of the Western physician, so that they will be able to elucidate the results in respect of the Tridosh and Rasa-Vipaka-Veerya-Prabhav-Siddhants. Points of contact can thus be established for proving the veracity of the Ayurvedic Doctrines and to arrive at a mutual understanding of what a particular disease means.

Conclusions should only be based on results of a very large number of cases (300-500) critically examined, diagnosed and treated.

26. *Research in Dravya-Guna-Rasa-Vipaka-Veerya-Prabhav and in Dietetics.*—Herb medication acquires its importance from the belief that whatever God has created on this earth must have a purpose of its own and that too, for the good of man. The belief becomes firmer still, when it is asserted that what is good for the individuals of any part of the country or clime, is created by God in those parts or climes alone. The belief in herbs growing on different mountains and at different heights may be rational because of their nascent condition uninfluenced by men and animals. Herb remedies are conveniently obtainable, are not so harmful and preparations from them can readily be made. The reasons for the voluminous growth of the Herb pharmacopoeia can thus be easily found.

This is why attempts have been made in recent decades to arrive at a few simple truths, from amongst the vast and complicated mass of Herb and Drug Therapy. Our questions, Nos. 13, 14, 15 and 16 are in alignment with this idea prevalent among the intellectuals, to find out few and sure remedies for the needs of the illiterate public in the villages, and for the cure of their common ailments.

The idea of our collecting information about single Dravyas (Drugs) useful in a particular disease was to limit, to begin with, the field of Chemical, Pharmacological and Clinical research, make it more defined and to find exhaustive information on these single drugs,—information which could profitably be utilized later on, in the study of compound preparations.

The list of single drugs, as also of compound preparations, varies enormously from city to city and from state to state, each one of which is apparently infallible in the particular diseases mentioned against their name. This depends more on the School of Thought where the Ayurvedic practitioner received his education, than on the comparative merits or demerits of the Dravyas themselves. Minor complaints and diseases vary much in the complexity of their symptomatology, and a cure energetically applied to one symptom often clears trigger-wise, the whole clinical picture on account of inherent tendencies dormant in man, and ensures early return

to normality. Here, perhaps, lies the explanation of the preference shown above to particular drugs by Ayurvedists to the exclusion of the rest.

The Ayurvedic Rasa-Viapka-Veerya etc. method of describing the Gunas (properties) of a drug, appears in itself to be reasonable.

It is desirable to test the veracity of those Rasa, Guna, Veerya, Vipaka clinically. For we believe that the ancient sages have based their conclusions on results produced on the human body. After this verification, further investigation should be carried out wherever possible in chemical and pharmacological laboratories. But negative pharmacological evidence can only indicate that the method of investigation is unsuitable.

“Padartha-Vidnyan” (the discourse on Elements) “Rasa-Shastra” (the science of Metallic preparations) and “Agada-Tantra” (Toxicology) deserve investigation to verify the principles and properties mentioned in Ayurvedic texts, by pharmacological and or clinical methods. The most important, as mentioned in Chapter V, Section 28, should be taken up first.

Ayurvedic Pharmacology is based not only on the drug as such, before it is administered, but also on the possible transformation (Vipaka-Veerya-Prabhav) and actions that take place in the body. The drug's properties might also vary with every pharmaceutical process it undergoes. The method of administration of the drug is often a varied process and uses other substances (Anupan) for modifying the action of the main drug, so as to make it more beneficial; sometimes these substances are used as mere vehicles for the drug to be taken.

The prescribing of beneficial “Diet” and avoidance of harmful food-articles (Pathya-Pathya) for the production of certain drug effects is a second complicating factor in the investigation of drugs and the cause of many a failure in pharmacological or biological research.

Attempts should, therefore, be made to verify the properties of Ayurvedic drugs by clinical means in Health and in Disease by observation of the changes induced in clinical signs and symptoms during a treatment and progress towards convalescence.

A similar attempt should be made to classify and to find out the properties of any of the useful drugs in Western Medicine and to determine their clinical application in a certain group of causations, symptoms or diagnostic signs as determined by Ayurvedic methods.

The study of Ayurvedic Dietetics will provide a vast field of useful research even to the Westerners.

27. *Research in Pharmaceutics.*—Ayurvedic Pharmaceutical processes are just as varied and complex as the drugs themselves, and every Vaidya believes in the method of preparation he is accustomed to, to the exclusion of all the rest. Experiments should be undertaken to verify if possible, the value of the methods of these preparations and of the new properties induced by each of these methods.

It is also desirable to estimate the value of Ayurvedic Shodhan, Maran, etc. pharmaceutical manipulations, which are said to bring about either colloid changes, or a change of isomers, or of unstable into stable forms, or of poisonous into non-poisonous forms. The great esteem in which these drugs are held, especially those with costlier ingredients like gold, pearls, diamonds, etc. requires similar elucidation.

There is at present a tendency to prepare concentrated or dry extracts and convert them into pills, in place of fresh decoctions or infusions mentioned in Ayurveda; or, Tinctures are made of them in the belief that these have the same properties as the original crude drug. Such modifications require investigation, before they are accepted as standard processes of Ayurvedic pharmaceutics.

It would generally be useful to bring about standardization and uniformity in the processes of manufacture. This will also help to enhance the efficacy of the drugs and reduce costs.

A Central Herbarium and a Museum are an urgent necessity for the identification of drugs, if pharmacological research is to have any value and if pharmaceutics is to be properly organised. It performs in Drug-Research, the same function as that of a historical record, to diagnose correct drugs from spurious ones.

CHAPTER V

COGNATE PROBLEMS

Government, in their Directive No. (vi) (Page 1) desire us to report on any *Cognate Problems* that may crop up during the Inquiry into Research in Ayurveda.

28. Several such arise even during the planning of a Research so comprehensive as that of Ayurveda. We mention below, however, four such which could usefully be tackled side by side with the larger issues, for *Ayurveda has a Past, the Present and the Future*, in order to bring it in alignment with the needs of the times.

These are :—

- (1) Standardization of drugs and their preparations,
- (2) The Preparation of a useful Pharmacopoeia,
- (3) The Compilation of Text-Books,
- (4) The Study of Health.

29. *Standardization*.—Standardization of single drugs required for everyday practice, collected and prepared locally, is not a simple task, for, prevention of adulteration in these standardised products would be still more difficult. If these drugs are to be used, the best thing would be to make them available in a pure, original and potent form, to whom-so-ever wants them. Ayurvedic methods of selection, preparation and preservation should, however, be strictly followed if a manufacture on a large scale is intended. Modern methods may be adopted whenever they are found useful.

What has been mentioned above applies equally well to compound drugs.

30 *Pharmacopoeia*.—The multiplicity, of single drugs suggested in Chapter IV, Section 26 and the varieties of diseases they are used in, makes, apart from specific investigations, even the preparation of a basic pharmacopoeia, a difficult task and gives wide scope to individual likes and dislikes based on individual successes or failures. An attempt must, however, be made to bring it into a commendable form.

31. *Text-Books*.—

The Text Books should be written subject-wise to suit the students' immediate needs, first in any Indian Language in which an expert is available and then in clear Sanskrit or Hindi, avoiding ambiguities, to make it easy for any one to translate the same, later on, in the regional languages. There will thus be uniformity in the teaching of Ayurveda, all the India over.

This should, however, be done after the terminology is determined and a dictionary compiled, to explain the correct meaning of a word, a term or an aphorism; Clinical studies will help a great deal in determining these meanings.

The Text-Books should be devoid of all brevity and repetition wherever possible. Each disease should further be dealt with seriatum, starting with history of the disease, its etiology, symptomatology etc.

Many "unverifiable" quotations are found in Ayurvedic literature. Since no explanation can be offered on these anomalies, they will continue to be a mystery, until further study of the literature throws light on the quotations. A critical study of these, is, therefore, necessary.

32. *The Study of Health & Hygiene.*—Too much attention is now-a-days concentrated on therapeutics and cure of diseases, and the controversy raging round them, is often acute and bitter. India lies more in the villages than in cities and its need is not only the freedom from disease but a shift to Positive Health. "Ayurveda is the study of life processes"; if the Tridoshas rule the human body, their balanced compilations to the highest possible pitch, would free the body from diseases during the allotted span of life and ensure positive health and longevity for the benefit of family happiness and national prosperity. Even the apparently healthy, now-a-days, get old too quickly and die much too early to the disappointment of everyone concerned. Preservation of self, ought to be considered just as valuable and important as preservation of the Nation. What we need most is conservation of Human Wealth, frittered away at present by beliefs in doubtful traditions and superstitions.

The study of *Swastha-Vritta* (Personal Hygiene) may possibly reveal the practical application of the *Laws of Life* as a supplement to what is found in modern Hygiene.

Even in matters of treatment, rapid modes of cure are required, that would be reliable, even infallible, and within the economic means of the individual in the village; and if for this purpose, dignity and prestige have to be sacrificed, there should be no hesitation on the part of savants of any system of medicine to lay these aside.

Ayurveda must stand the *Test of Utility and Rationality*, if it is to be acceptable to all classes of medical men.

CHAPTER VI

THE ORGANIZATION OF RESEARCH

Government have likewise, in their Directives ii, iii, iv and v desired us :—

- (1) To recommend organizations that would carry out such researches ;
- (2) To consider schemes of research ;
- (3) To frame a long term policy ;
- (4) To discuss the financial aspect of the same.

33. *Organization—(a) The Search for Qualified personnel.*—Research work is a difficult problem. It is not only a question of adequate emoluments, education and training, but of deep acquaintance with a variety of allied subjects, love for the subject love for research, continuous touch with literature, capacity to labour hard and long, perseverance, the capacity to see the other man's point-of-view, and firm faith in the work undertaken.

Such a combination is rather difficult to find in one individual.

Research Workers have often to be trained in their speciality and even a long apprenticeship need not be considered a wastage of time. Ayurvedic Research is a slow and laborious work of the pioneer type, where personal sacrifices would have to be made and hopes of personal advancement kept out of the way. Young Research Workers would be a great asset. An equally useful asset would be Research Workers, who have retired from Government service and who desire to devote themselves to such research work. Perhaps practitioners who have done well in life, and need not depend on their profession thereafter, may be induced to join and advance the cause of this research. It is the co-operation of all such that would be valuable in quality, if not in quantity, when difficult problems require adequate tackling.

(b) *The Research Board.*—A *Central Ayurvedic Research Institute* with its central research library, laboratories and a large hospital would be an ideal desideratum. But it will not be possible at present to establish such a one, for, it would be difficult to secure the services of proper research workers at one place. The research workers already present in the Institutions mentioned below, can be utilised, along with the facilities available in those institutions, if research work is portioned out. A *Central Research Library* would, however, be essential.

We recommend that an Ayurvedic Research Board consisting of five members, with powers to co-opt, should be established in Bombay State and that all the below-mentioned institutions and colleges should be asked to co-operate in their respective spheres of activity.

The Research Board should meet at least three times a year, should have powers to issue a directive to all its collaborators, initiate or control the different aspects of research, or end any of them, if unproductive.

(c) *Frequent round table conferences* on doubtful points supported by laboratory and clinical evidence would clear up the position, regarding the practicability and usefulness of a research.

(d) *Co-operation.*—All the Teaching Institutes of Ayurveda in this State and Saurashtra have shown their readiness to undertake research, and many of the others who have sent in replies, have offered individual help. The Ayurvedic Pharmaceutical Institutes in Bombay State, are likewise prepared to offer help. The Medical Colleges of Western Medicine, in Bombay and Poona with their attached Hospitals, are likely to offer co-operation. We feel that each one of the above can be put to some definite and beneficial use.

Many of those who have offered their services appear to be enthusiastic enough, provided the Board has the backing of the Government.

(e) The co-operation of Research students of other systems of medicines and scientists, would be useful, only if they know Ayurveda just as well and deeply, and desire to throw light on portions which even according to them, deserve to be looked into.

CHAPTER VII

THE SCHEME OF RESEARCH

34. Various individual but scattered attempts have been made during the last few decades all over India (Chapter II, Section 9) to explore and establish Ayurveda on sound lines and the literature so produced is already vast in amount, in various vernaculars of India. What is now needed is a systematic and persistent drive in the organization and execution of this Research, so that conflicts may be avoided, and a system that is suitable to the India of present day may be evolved, a system that would demand respect from even the most orthodox among the Western Systems of Medicine.

The following six have been mentioned in Chapter IV, Section 21, as fit subjects of main research and the subsequent four as subjects of cognate research in Chapter V, Section 28 :

- (1) Study of Ayurvedic literature ;
- (2) Study of Psychology as propounded in Ayurveda ;
- (3) Study of the Doctrines of Ayurveda ;
- (4) Clinical studies in Diagnosis & Treatment as described in Ayurvedic texts ;
- (5) Pharmaceutic, Pharmacologic, & Therapeutic study of Ayurvedic drugs ;
- (6) Study of Dietetics as described in Ayurveda ;
- (7) Standardization of Drugs ;
- (8) Compilation of a Pharmacopoeia ;
- (9) Compilation of Text-Books ;
- (10) The study of Hygiene and Health.

35. We have suggested that in order to save time and money and enable persons interested in Ayurveda to start work immediately, a Central Research Board of five persons instead of a Central Research Institute should be established, which would apportion the Research work, where it can at present be carried out most efficiently, at minimum cost. The Research Board will meet at least three times a year, scrutinize the reports received from various research sections, keep in close touch with them and issue instructions from time to time.

Among the institutions and individuals who have offered help, we consider that, *for the present*, the following institutions should be requested to undertake the research allotted to them, with the help of research workers, they themselves have recommended, or in order to ensure an agreement in ideas and uniformity in procedure :—

- (1) Ayurveda Maha-Vidyalaya, Poona ;
- (2) Ayurveda Vidyalaya, Jamnagar (Saurashtra) ;
- (3) R. A. Podar Ayurvedic Medical College, Bombay ;
- (4) Aryangla Vaidyak Mahavidyalaya, Satara.

36. We feel that the Scheme of Research we recommend hereafter will receive considerate approval. We propose to discuss (1) the Methods of research of the above 10 problems, and (2) discuss in the next Chapter their priorities and the short and long term policies to be adopted with reference to each of them, (3) their financial aspects are discussed in Chapter IX.

37. *The Study of Ayurvedic Literature.*—The aim of this research is to collect all information on theories of Ayurveda and its sections including hygiene, methods of treatment, plant and other remedies, medicine and surgery in war, etc. from eminent works of the period, such as the Vedic literature, Mahabharat, Puranas, Dharmashastras, Smritis, Grihya-Sutras, Darshanas, Artha-Shastras etc. This will again have to be studied and screened with regard to its application and allocated subjectwise and chronologically, before a *thesis* is undertaken in each subject in correlation with the rest.

We suggest that this Research should be handed over to the authorities of the Ayurveda Vidyalaya, Jamnagar, as they have been working at it for several years and are well-conversant with the methods to be employed and the compilation of the information.

We recommend that four full-time qualified Junior Ayurvedists, from one of the recognised Schools with special knowledge of Sanskrit, should be appointed and the section be placed in charge of a Senior Honorary Expert, who will be responsible to the Board, perhaps like Dr. Pranjeevan Mehta, M. D., M. S. etc. who has already devoted several years of his life for such a Research.

This Research will have to be continued for over twenty years as a long term policy, when we hope that, by occasional changes in the centre of work, all the literature that would throw light on Ayurveda, would have been explored and finalized. It may perhaps be necessary to take up more juniors in order to expedite the work, if the method of exploration is acceptable to all.

We recommend that the Senior should be paid Rs. 300 per month for his part-time services of 4 hours a day (i.e. Rs. 3,600 per year) and the juniors should be paid Rs. 250-300-600, for with successive years, the compilation of the information would be an increasingly difficult task requiring maturer persons to deal with the subject. The juniors, if encouraged, would prove valuable assets in various branches of Ayurveda as this research progresses. The total cost would be $\text{Rs. } 250 \times 4 \times 12 = 12,000$ plus Rs. 3,600 = Rs. 15,600 per year.

Acharya Jadavji, who is perhaps the greatest Ayurvedic literature and Research Worker in India, can show the sources where such literature can be found and utilized to the best

advantage, which will save the costs of the Central Research Library.

A *Central Research Library* would be essential which will cost at least Rs. 60,000 to begin with. We suggest that excepting for the common Western Medical books, none other Western Medical books should be purchased and full use should be made of the Library of the Haffkine Institute, the Grant Medical and the Gordhandas Sunderdas Medical Colleges. The Library should, however, possess anything available on Ayurveda.

38. *Research in the texts of Psychology* in Ayurveda and other Sanskrit literature should be carried out *pari-pasu* at the same centre in Jamnagar; it would thus be more productive in quality than in quantity. The Research Worker should be one who may preferably not have known what Western Psychology has to say on the subject, in order that the Ayurvedic compilation may be an unprejudiced one.

This also should be entrusted to a similar (fifth) full time junior worker, supervised by the same Senior Honorary Expert. The cost would be Rs. $250 \times 12 =$ Rs. 3,000 per year.

In view of the argument advanced in Sections 22 & 23, we have a further corollary to add to this section of Research. As the ideas on Ayurvedic Psychology get cleared up and their place determined both in the theory and practice of Ayurveda, they should be examined and commented upon by a Western Psychology Expert to find out the place of Ayurvedic Psychology in Western Medicine as well. We firmly believe (*vide* Sections 19 and 23) that interesting and instructive information would thus be available for the elucidation of both mental and bodily diseases and add something substantial to our knowledge of Mental health, Intellectual health and Spiritual health (*vide* Sections 19, 22 & 32).

39. *Study of (a) the Pancha-Mahabhuta and Tri-dosha Doctrines of Ayurveda.*—This has so far proved such a highly philosophical and controversial point among the various schools of thought in Ayurveda, as to produce an amount of literature which is difficult to keep in touch with, even for the best of partisans in Ayurveda. We feel that nothing more useful would be discovered hereafter, to provide decisive arguments in favour of any side and that a firm closure should be applied by Government itself, on behalf of the majority view, so as to clear the path for further research and for the writing of text-books, which are now much overdue.

A Committee of 15 Experts in Ayurveda from all over India, including some who have received training in Western medicine, should be appointed to discuss this subject, and to deliver

a unanimous or a majority judgment within the space of one year on the basis of the literature that is available and give directions for the compilation of an authoritative book on the same.

We also suggest that the Tri-dosha theory should be studied clinically and therapeutically in hospitals (*vide* section 40) in order to clear up or increase the understanding of certain terms, that usually prove a stumbling block, when only the theoretical part is under consideration. This is essential in order that research may be initiated on a proper basis and text books common to all institutions may be compiled.

Such an enquiry on an All-India Basis, can fall within the purview of any one State and ought not to be shelved hereafter. The Experts would consider it an honour to be members of this Committee and would not expect any honorariums if their Expenses and Haltage are paid for, viz. about Rs. 8,000 to 10,000. The selection of such a Committee should be left to the Central Research Board we have indicated above. The publication of an authoritative work on Tri-dosha would cost about Rs. 4,000.

(b) *The Study of Dravya-Guna-Rasa-Vipaka-Veerya-Prabhava-theory*, though difficult in laboratories of the Western type, might be possible as a clinical and therapeutic study in the above hospitals, for, very few attempts have been made so far to elucidate the same. A committee of experts in Rasa-Shastra and Padartha-Vidnyan aided by Chemists, Bio-Chemists and Pharmacologists, might succeed in evolving a plan during the course of clinical research mentioned hereafter in Section 40.

This would be a long term programme, proportionate to the clinical units established and would not involve any additional financial responsibility.

40. *Clinical Studies in Diagnosis & Treatment as described in Ayurvedic Texts.*—This is an important part of Research for it deals with the practice of Ayurveda as may finally be accepted even for the villages and on it, would depend the Utility and Rationality of Ayurveda in the eyes of the Medical world.

The objectives of this Research are (a) to find out the nature of Tri-dosha, (b) the method of Ayurvedic Diagnosis, (c) the effect of Ayurvedic Therapeutic or other treatment, (d) the study of Dravya-Guna-Rasa etc. theory to find out methods of treatment which are cheap, safe, effective and capable of being used also in villages. The results should be based on 300 to 500 cases as far as possible, after a "follow-up" for a reasonable period of time.

This would perhaps prove one of the longest termed programmes when looked at from the disease point of view and

may not yield adequate results for some years. Some planning will, therefore, have to be made in the number and nature of diseases under investigation. We suggest the following diseases to begin with : (1) on account of their extent, (2) the large number of cases available at a time, and (3) on the grounds of their being often a "Despair" to the Western Physicians. They can further be tackled either in the Hospital wards which is a costly method or in the out-patient department, which is comparatively a cheap method.

The diseases for study are : (1) Anaemia (excluding Iron-deficiency cases), (2) Chronic Diarrhoea including Sprue, (3) Anasarca & Ascitis (Shoth-Udar), (4) Rheumatoid Arthritis (Sandhi-Vata) & Acute Rheumatism (Ama-Vata), (5) Helminthiasis (Krimi-Roga), (6) Diabetes (Madhumeha), (7) Epilepsy (Apsamar), (8) Angina pectoris (Hridaya-Shoola), (9) Obesity, (10) Lean-ness, (11) Paraplegia, (12) Facial Palsy and (13) Hemiplegia (Vata-Roga). It is possible that in co-operation with other Hospitals in a city like Bombay and Poona, a large number of cases, will always be forthcoming for the above twelve chronic complaints. The above list should be open to revision and addition by the Research Board.

Acute complaints have been deliberately omitted from the above list as it is difficult to evaluate the result of treatment by research methods. Provision is, however, made in the scheme for cases of other acute and chronic diseases (*vide* Section 25).

The scheme should be based on the Unit system of about 60 beds with a male ward of 30 beds and a female and children's ward of another 30 beds. There should be two part-time Senior Honorary Vaidyas in charge of each 30 beds of males, females and children each of whom should be assisted by one whole-time Junior Qualified Vaidya.

We have suggested in Section 24, that studies in a Bio-Chemical Laboratory including Blood Examination in all its aspects might throw light on the conception of Tri-dosha and the methods of diagnosis ; a comparative clinical record by Western methods might also help in establishing recognisable points of contact and make the picture of Tri-dosha clearer still to Western medicine.

A Clinical, Bacteriological & Pathological Laboratory should be provided for the staff of Western Medicine to carry out all possible examinations in the diseases mentioned above. Means for X-Ray diagnosis should also be available to this team. This department should be in charge of a part-time Senior Pathologist, one full-time Bio-Chemist, and two whole-time clinical laboratory assistants.

This counterpart of Ayurvedic study will, therefore, similarly require two Honorary Senior Part-time Medical Officers of M. D. & M. S. status, each of whom will again be assisted by whole-time Junior Medical & Surgical Registrars of the M. B., B. S. grade. Comparative Records should be maintained on standard forms, approved by the Senior Research Workers.

The Ayurvedic team will be assisted by one (1) whole-time Vaidya Senior Pharmacognosist to procure and identify the drugs prescribed and also to take part in the larger scheme of preparing a herbarium, a drug museum and medical-botanical garden (*vide* section 27). Senior Vaidya Pharmacist (whole-time) and two assistant Junior Vaidya Pharmacists whole-time will be required to dispense the prescriptions of the Vaidyas, and to help in the research of Pharmaceutics (Section 41).

A part-time Botanist (B.Sc.) and one whole-time Pharmacist and Chemist (M.Sc.) will be required to aid the clinical and Pharmaceutic Research.

A Medical Social Worker with the Diploma in Social Sciences should be attached to the Units to keep the medical staff in contact with the patient and to collect the necessary Home-data for the study of the Psychological aspect of diagnosis and treatment (*vide* Section 23).

It must be remembered that the rapidity and extent of cure in many diseases are dependent on ever so many factors, *viz.* : complete physical and mental rest, a good bed, fresh air, quiet, cheerful and sunny surroundings, means for relaxation of mind, freedom from home worries, congenial company, good hot appetizing food with plenty of variety in it, proper attention to body necessities (*Pancha-Karmas*), good sleep, an optimistic outlook, *intelligent nursing* which anticipates the patients' needs, light exercises in bed or massage, an invigorating bath or sponging. *A spiritual atmosphere* of high morals, sacrifice, love and service to God are some of the physical, psychological and spiritual methods of treatments, which means so much to the patient and which contribute a major share in bringing about convalescence and permanent cure in most diseases. Keeping in mind that a favourable atmosphere helps treatment by drugs, every effort should be made to bring about this atmosphere. No wonder, therefore, if eminent physicians assert that a correct diagnosis may indicate a line of medical treatment, but a cure by this treatment can not indicate that the diagnosis was correct. All the factors mentioned above are included in good and intelligent Nursing.

The Emoluments of the staff must err on the liberal side when basic starts are considered; the following scales are recommended for One Unit of 120 beds with Out-Patient duties :

	Per month. Rs.
4 Honorary Senior part-time Vaidyas or Physicians or Surgeons each Rs. 300 ...	1,200
4 Whole-time Junior Vaidyas or Registrars each Rs. 250-30-600 per month ...	1,000
1 Honorary part-time Senior Pathologist ...	300
1 Honorary part-time Senior Bacteriologist ...	300
1 Whole-time Senior Vaidya & Pharmacognocist Rs. 350-20-600 ...	350
1 Whole-time Senior Vaidya Pharmacist } 1 Whole-time Pharmacist & Chemist } (Ph. D., M.Sc.) }	1,050
1 Whole-time M. Sc., Ph. D. for high class chemical work. }	
1 Part-time Botanist (B.Sc.) Rs. 200 ...	200
2 Whole-time Junior Vaidya Pharmacists 250-30-600 ...	500
4 Laboratory Assistants each at Rs. 200-10-250 (preferably B.Sc. Chemists) ...	800
1 Medical Social Worker for follow up 250-20-500 ...	250
for the 1st year	5,950

This will constitute the Research Staff. The Junior staff should be selected by the Central Research Board after advertisement of the posts.

A Pharmaceutical Laboratory of (1) the Ayurvedic and (2) Western Medicine type will be necessary, as also (3) a Pathological, (4) a Bacteriological, (5) a Clinical, and (6) a Chemical Laboratory. A Herbarium and an Ayurvedic Drug Museum should be provided. Arrangements for X-Ray examination had better be made with another large hospital as it would not be economical to provide this unit for a small hospital of 120 beds. The patients should be carried there in an ambulance.

Each of the above six Laboratories would cost 20 to 30 thousand rupees and will be hard to equip in these days of "Exchange" difficulties. Perhaps, co-operation with the three premiere Institutions in Bombay and Poona would help to solve the difficulty and save money in the initial stages, until more insight is obtained by the Research Board of the problems to be tackled.

A Hospital with 120 beds would form an economic administrative unit. There will, therefore, have to be an Administrative staff for the Hospital with a Superintendent, a Secretary, a Matron, 14 Nurses, 8 Ward-Boys, 6 Sweepers, one Dhobi, one Store-keeper, 3 Watchmen and 2 Peons.

Advantage can be taken for the present of the two big Ayurvedic Hospitals in Bombay and Poona, viz.: Podar and Tarachand Ramnath Hospitals, where teaching and research can profitably be combined.

This is a long-term programme and will have to be continued for at least 20 years, in order to obtain a firmer grasp of future lines of Research.

41. *Pharmaceutic, Pharmacologic and Therapeutic study of Ayurvedic Drugs.*—This research can only bear fruit if it is conducted side by side with clinical studies mentioned above.

(a) *Standard methods in Pharmaceutics* will have to be evolved and an attempt made to take advantage of Western aids from Physics, in order to bring definiteness, uniformity and accuracy in the preparations turned out. This will help production of drugs in large quantities, enhance their quality and reduce manufacturing costs.

The staff indicated above will suffice to begin with, for this long-term programme.

(b) *Pharmacological investigation*:—Indications of this have been given in section 26 and it is suggested that a beginning may be made with single drugs, if possible; for, compound drugs are found in Ayurveda to have different properties than the ones contained in the compound and act as single drugs.

Such an investigation will also help to determine the Rasa, Guna, Vipaka, Veerya, Prabhav, of drugs from the Ayurvedic point of view. It is possible that whatever properties of drugs are mentioned in Ayurveda and which are found to be true in clinical practice, may not be confirmed by experimental evidence in Pharmacological and Chemical Laboratory.

The Laboratory evidence may still give broad indications of the properties of a drug when administered in toxic doses to healthy animals.

As Padartha Vidnyan is included in Pancha-Mahabhuta Vidnyan and Psychology, it is not necessary to have a separate investigation for this subject. The investigation of Rasa-Shastra should be included in Pharmacy and therapeutics. The investigation of Agad-Tantra should be included in Dravya-Guna and Therapeutics.

A full-time Pharmacologist (Rs. 500—30—800) and an Organic Chemist assisted by two Laboratory Assistants in each section would be required. As the Organic Chemist and his assistants have been provided for in Section 40, only a Pharmacologist's appointment need be considered here.

(c) *Therapeutic Study of Drugs* is a still more difficult problem when the objects of study are to be human beings.

The study of Dravya-Guna-Rasa-Veerya, etc., falls under this head. Western Medicine has so far no positive methods to

indicate qualitative and quantitative estimation of Rasa-Veerya, etc., properties. It is for the committee of experts in Rasa-Shastra and Dravya-Guna Vidnyan to indicate the methods of this investigation. No separate scheme can, therefore, be outlined for this research; but so far as we can see it can in the initial stages be made a side-study in the various problems indicated above.

42. *The Study of Dietetics* as mentioned in Ayurvedic texts would prove an important study even for Nutrition in Health. The complexities of the structures of proteins, fats, sugars and vitamins and the combinations of the amino-acids, fatty-acids, etc., may account for the varieties of properties (Gunas) mentioned in Ayurvedic texts. A chemical analysis of every food substance (grains, vegetables, etc.) will have to be carried out in qualitative and quantitative terms on (1) raw, (2) preserved, (3) cooked and (4) cooked and preserved articles of food. The presence of a variety of salts in food-substances increases further the complexities of the problem. It must have taken the Ayurvedists of old, considerable number of decades, perhaps centuries, to discover the properties of every food substance they came across and to find for them a place in therapeutics of health and disease. The present day bio-chemists need not, therefore, be disappointed with the slowness of results obtained and the length of time over which the study would be spread out.

This research is, therefore, a long-term proposition and will require a bio-chemist of high repute to guide a team of workers under his charge. His salary should range from Rs. 500—30—800 and his two junior assistants should be given Rs. 250—30—600. They will further require the aid of four Laboratory Assistants on a salary of Rs. 200—10—250. The monthly initial expenditure of such a unit will be :—

	Per month.
	Rs.
1. Senior Bio-Chemist Rs. 500—30—800	... 500
2. Junior Assistant Bio-Chemists Rs. 250—30—600	... 500
4. Laboratory Assistants Rs. 200—10—250 (preferably B.Sc.)	... 800
	Rs. 1,800

A well-equipped laboratory with an animal house as is found in the Haffkine Institute will have to be provided and will cost initially Rs. 10,000 at least. The Nutrition Department of our Government at present located in Haffkine Institute might usefully be approached for this help.

43. Standardization is a side issue, a cognate problem (*vide* section 29), which will assume increasing importance when well-tried drugs receive the Government stamp of high utility. Standardization will prove a sure check on adulteration and illegal profiteering, and can be carried out by the batch of organic and inorganic chemists mentioned in the foregoing research schemes. A Standardization Department will, however, have to be created later on, for carrying out routine work sent to them and its organization will depend on the number of samples sent to it.

44. Compilation of the Pharmacopoeia is an urgent necessity. The students of Ayurveda are presented with an interminable list of drugs and their combinations, whose methods of preparation and use in practical therapeutics is hardly ever pointed out to them. A tentative pharmacopoeia should, therefore, be compiled, more from the point of view of drugs and preparations in common use than as a dictionary of drugs mentioned in the literature. Such a pharmacopoeia will vary from State to State.

A Committee of five experts (Ayurvedists, Pharmacutists and Physicians) should be appointed by the Central Research Board, who should select the drugs that deserve inclusion in a State pharmacopoeia and themselves write out the pharmacognosy and the pharmaceutics of two or more drugs by way of illustration, to serve as models to future writers of pharmacopoeia to whom the work should be entrusted on piece-work basis. The compilation of a *Materia-Medica* based on such a pharmacopoeia should follow suit.

This compilation ought not to take more than a year and should not cost more than Rs. 1,000 for authorship rights. The expert committee for the revision of the pharmacopoeia should be re-appointed every ten years as is done in Western countries or as soon as an edition is exhausted. The printing will cost another Rs. 3,000.

45. The compilation of text-books is a still greater necessity, since Government have assumed responsibility for the teaching of Ayurveda and for finding responsible posts for those who pass out.

The compilation of texts can not await any longer the compilation of an authoritative dictionary, nor the elucidation of the Doctrines of Ayurveda. A revision of text-books is bound to come within a few years, when the 2nd or the 3rd edition of these text-books can incorporate the newer information then available.

A Text-book Committee of five experts appointed by the Central Research Board should be nominated on the same lines as the Pharmacopoeia committee and text-books got written, in

conformity with the syllabuses, such as can be taught within the period allotted for training, and as suggested in Section 31. They can be written in any language to start with, with quotations from the original texts. The present text-books should be explored, before new ones are taken in hand. The author's honorarium need not exceed Rs. 300 to Rs. 1,000 per book according to its size and importance. We consider that this work should be entrusted to our eminent colleagues Acharya Jadavji. The printing would cost Rs. 1,000 to Rs. 3,000 and the total cost for about 12 such text-books would be Rs. 35,000. The work ought to be completed within one or two years.

46. *The compilation of an Ayurvedic Dictionary* is another urgent necessity.—A Committee of three experts is again necessary for this purpose, who should be aided by a set of three junior workers to hunt up the literature for references for the various shades of meaning for any term used in the Dictionary. The experts may perhaps accept Rs. 100 per month as honorarium, while the juniors will be full-time workers for three to four years in the grade of Rs. 250—30—600. The total cost of compilation would be $\text{Rs. } 250 \times 3 \times 12 = \text{Rs. } 9,000$ plus $\text{Rs. } 100 \times 3 \times 12 = \text{Rs. } 3,600 = \text{Rs. } 12,600$. The printing would cost another Rs. 5,000. A round sum of Rs. 50 to 60,000 would be required for bringing out such a dictionary.

47. *Studies in Health and Hygiene*.—This again is a vast subject and the Research Unit on literature (Section 37) should also be entrusted with this task. Ayurveda is the science of healthy living and ought, therefore, to have to say much on this subject which appears to have been neglected so far. No separate financial provision need be made for the present. Printing of such books will be an additional charge.

CHAPTER VIII

SHORT AND LONG TERM POLICIES

48. Most of the questions that arise require consideration from four points of view : *merit, urgency, period, and expenditure*. In Sections 21 and 28, the subjects have been mentioned in order of merit so that progress may be consistent and un-interrupted. The four cognate problems in Section 28 are really no research, but arise out of the necessities of present times, in order to establish the Utility and Rationality of Ayurveda.

49. The question of urgency would demand a consideration of Priorities in each part of the above two and another different order, if the two are to be carried out simultaneously.

Research Problems.	Cognate Problems.
1. Clinical studies in Diagnosis and treatment.	1. Compilation of Text-books.
2. Pharmacologic, Therapeutic and Pharmaceutical studies.	2. Standardization of Drugs.
3. Study of (a) Ayurvedic literature, (b) Psychology in Ayurveda, (c) Health.	3. Compilation of Pharmacopoeia.
4. Study of Doctrines of Ayurveda.	

50. For simultaneous consideration the order would be :—

- | | |
|--|---------------|
| 1. Compilation of Text-Books | (one year); |
| 2. Compilation of Pharmacopoeia and Materia-Medica | (one year); |
| 3. Clinical studies in Diagnosis and treatment | (20 years); |
| 4. Pharmacopoeia, Pharmaceutic and Therapeutic studies ; | } (20 years); |
| 5. Standardization of Drugs ; | |
| 6. Study in literature, psychology and health | (20 years); |
| 7. Compilation of a Dictionary | (3 years). |

The reasons for this arrangement are obvious as mentioned in previous sections. Authoritative texts are urgently needed in this transition period of co-education in Ayurveda and Western Medicine, so that the immediate generation of students may receive a stable foundation and be inspired with respect for, and firm belief in the tenets of Ayurveda.

The present Ayurvedic pharmacopoeia and materia-medica is equally baffling to students and to Westerners and must, therefore, be presented in a compact, useful and reliable form.

The subsequent problems need not wait for the completion of text-books or the Pharmacopoeia. The urgency of clinical and pharmacologic studies is the greatest, for, Government is often blamed by responsible authorities for pampering and bolstering up an old system which has out-lived its utility and rationality.

The length of inquiry whether short-termed or long, is indicated above.

We recommend that all the above inquiries and compilations should be distributed among various centres of research indicated above.

CHAPTER IX

FINANCIAL IMPLICATIONS

51. The following is a summary of the Problems and Necessities proposed, the time they would require and the total cost or cost per year in the serial order of their urgency as mentioned in Section 50 :—

Problems and Necessities.	Period in years.	Cost. Rs.
1. Compilation of 12 Text-books.	... 1 year	35,000
2. Compilation of an Ayurvedic Dictionary.	... 3 years	60,000
3. Compilation of a Pharmacopoeia.	... 1 year	4,000
4. A Central Research Library	... 3 years	60,000
5. Study of Doctrines of Ayurveda.	... 1 year (1st year)	14,000
6. Clinical studies in Diagnosis and Treatment.	... 20 years	72,000
7. Equipment of six Laboratories, Rs. 10,000 to Rs. 20,000 each.	
8. (a) Pharmaceutic Research	... 20 years
(b) Pharmacologic research per year.	... 20 years	6,000
(c) Therapeutic Research	... 20 years
9. Standardization of Drugs	... 20 years
10. Studies in Literature, Psychology and Health—per year.	... 20 years	19,000
11. Studies in Dietetics per year	... 20 years	21,600
		2,91,600

The above is an approximate estimate for 5 complete urgent projects, for one to three years only, and for 6 long-term projects and does not include any laboratory or hospital outlay and expenses for the same, nor for any office establishment and contingent charges for the office and the investigations.

Intelligent co-operation and the will to work for the love and glory of Ayurveda shall be the key-note of this Research. Personal sacrifices will be asked for and will very likely be received in consideration of the finances of our Government and the urgency of the Problems.

CHAPTER X

RECOMMENDATIONS

1. The Methods of Research in Ayurveda should be in accord with the Ayurvedic System itself and modern methods of investigation should be resorted to, whenever necessary.
2. Authoritative versions of ancient Ayurvedic texts will have to be collected, carefully edited and published.
3. Dharmashastras, Smritis, Grihya-Sutras, Darshanas, Artha-Shastras, Vedic literature, Mahabharat, Puranas etc. will have to be studied from the Ayurvedic point of view in order to make Ayurveda clearer still.
4. Words and Terms used in Ayurvedic literature will have to be given fixed meanings either by the study of literature or through clinical studies; a standard dictionary should thereafter be compiled. This work should be taken up immediately in hand.
5. The Psychological Doctrines in Ayurveda require study as they appear to have already anticipated the modern trends in Western Psychology and commented on them.
6. The general Fundamental Doctrines of (1) Panchamaha—Bhoota, (ii) Tri-guna, (iii) Tri-Dosha, (iv) Dravya-Guna-Rasa-Vipaka-Veerya-Prabhava must be clarified. This will help to elucidate Sharir-Kriya (Physiology) as well.
7. A co-ordinated study of Svastha-Vritta (Personal Hygiene) and Modern Hygiene would be a fruitful source of study of the Laws of Life.
8. Co-ordinated clinical research with a team consisting of Vaidyas and Research minded medical persons would be a fruitful line of approach for the clarification of the principles and methods of diagnosis (Nidana) and Treatment of Diseases (Chikitsa).
9. "Dietetics" in Health and Disease and its influence on Body and Mind would prove an important subject of research and might possibly aid the study of modern nutrition.
10. A Herbarium, a Botanical Garden, and a Museum of drugs are an important prelude to the study of drugs and modes of treatment.
11. A Sanskrit name must be fixed for every plant, synonymous with the scientific botanical name, for proper identification of a plant in any part of the country, and its properties defined.
12. The pharmacological properties and thereapeutic values of single remedies should be explored first.

13. Standardisation of drugs is necessary to ensure uniformity of composition, strength and purity of preparations.

14. "Padartha-Vidnyan", "Rasa-Shastra", and "Agada-Tantra" (Toxicology) deserve investigation.

15. Text-Books will have to be written "subject-wise" for students in any Indian language in which an expert is available. They should later be translated into Sanskrit or Hindi and then in regional languages, in order to make the teaching of them easier and understandable. Standard works like those of Charak, Sushruta Vagbhat and others should be utilised in the preparation of the text-books.

16. The Forest Department should be requested to supply authentic herbs for therapeutic purposes.

Research Board :

17. A State Research Board in Ayurveda should be established. The Board will (1) apportion and control the various sections of research and (2) arrange for the training of research workers.

18. The researches should be so designed, controlled and integrated as to be statistically comparable.

19. A Central Research Library should be established.

Signed

1. K. S. MHASKAR.
2. JADAVJI TRICUMJI.
3. B. B. YODH.
4. KRISHNASHASTRI KAVADE.
5. B. V. GOKHALE.

APPENDIX

THE QUESTIONNAIRE

1. What, in your opinion, should be the aim and objects of Research in Ayurveda?
2. What should be the general principles on which Research in Ayurveda be carried out?
3. What should be the order in which these Research problems be tackled?
4. What Institutions, in your opinion, are suitable for carrying out such Research?
5. Please give details of the facilities available at each Institution with regard to:—
 - (a) Average numbers of daily attendance of out-door and in-door patients;
 - (b) Names and qualifications of Vaidyas in your Institution, qualified to undertake research;
 - (c) System of keeping records in your Institution and for any Research already carried out.
6. Do you think that co-operation of practitioners of other medical systems and of scientists in general, should be invited in this research?
7. If so, in what way would you invite such co-operation from:—
 - (a) Graduates and Licentiates from Medical Colleges and Schools;
 - (b) From Yunani practitioners;
 - (c) From Homeopathic practitioners;
 - (d) From other scientists, like Chemists, Physicians, Botanists, etc.
8. What Centres, in your opinion, outside of the Bombay Province are suitable for co-ordinated research? Please give details of such centres or addresses from where these details can be obtained.
9. How would you plan research to clarify the TRI-DHATU or TRI-DOSHA theory of Ayurveda?
10. In what ways can the co-operation of modern Physiological and Pathological ideas be obtained for this purpose?
11. Give your ideas as to:—
 - (a) What is considered "DISEASE" in Ayurveda?
 - (b) The method of approach to these diseases as regards their NIDANA and CHIKITSA.
12. What should be the plan of research in testing drugs according to the RASA, GUNA, VIRYA, VIPAKA and PRABHAVA theory of Ayurveda?

13. Which Ayurvedic DRUGS are used in your practice, as SINGLE DRUG remedies? Give examples of such.
14. In what diseases are such SINGLE DRUG remedies valuable? Please give a short list of common diseases, where the above SINGLE DRUGS can be tried.
15. As a large number of compound drugs are used in certain well-known and recognised Ayurvedic preparations, is it necessary to select those most useful for study?
 - (A) Which, in your opinion, are the preparations that should be taken up for research in the first instance?
 - (B) How would you apply the RASA, GUNA, VIRYA, VIPAKA and PRABHAVA theory to such COMPOUNDED preparations?
 - (C) Do you apply this theory to each one of the individual drugs in the compounded preparation or to the whole preparation, after it has been compounded ready for use?
 - (D) Can you suggest any other procedure for determining the properties (GUNA-DHARMA) of these COMPOUND drugs?
16. In the Rasa-Shastra of Ayurveda, the heavy METALS are treated in various ways, such as Shodhan, Maran, etc. How would you plan research on the principles on which these are based and their value?
17. Various pharmaceutical processes are described in Ayurveda.
 - (A) Can you suggest methods of study for determining their value and their improvements?
 - (B) Would you like a correlated study of the Ayurvedic Pharmaceutical Processes and the modern Pharmaceutical processes?
18. In your study of Ayurveda during many years, have you come across instances where statements made in Ayurvedic texts could not be verified in actual practice? Mention these in detail.
19. (a) Is it necessary that TEXT-BOOKS in Ayurvedic Medicine be freshly written?
 - (b) Should they be written in Sanskrit, the all-India language or in the provincial languages?
 - (c) Should the writing of text-books be simultaneously in all these languages, or first in Sanskrit and then in the vernaculars?

- (d) Do you think that words used in ancient Ayurvedic texts are capable of different interpretations in parts?
 - (e) Would you agree that a final interpretation of these words is necessary, so that TEXT-BOOKS in Ayurvedic Medicine can be written in a uniform manner?
 - (f) Please describe the basis of preparing new TEXT-BOOKS.
20. How should financial help be rendered to research workers and to the Institution?
- (a) By "lump-grant"?
 - (b) Through establishing a separate Institution?
 - (c) By starting a department of research in existing Institutions?
 - (d) By scholarships or fellow-ships as recommended by an approved body?
 - (e) On approved Research through an approved body?
 - (f) On approved Research work?
 - (g) In any other manner you may suggest.