

1 *Introduction*

Homeopathy is a distinctly singular phenomenon in the history of medicine. It came into being as a result of the ideas and experiments of C.F.S. Hahnemann, and was initially developed over the decades spanning the late eighteenth and early nineteenth centuries. It met with mixed fortunes, and spread to varying extents to the other continents, but what is most astonishing is that even today, some 200 years later and despite the enormous advances in the field of the instruments available to biomedical research, there is no consensus of opinion either as to its efficacy or as to its mechanism of action. On the other hand, in view of the increasing practical applications of homeopathy, which in Europe alone is now used by some 30 million people and has recently been accorded a form of recognition even at the level of the European Parliament (i.e. Resolution A4-0075, 1997), there can be no denying the fact that studies on its efficacy, a working definition of its fields of application, and some degree of rationalization of its theoretical basis are not only scientifically desirable, but also necessary in view of the public-health, social-welfare, and economic implications involved. These fundamental issues are addressed in this book on the basis of a critical and rational approach.

The basic hypothesis presented here is that *the progress of biomedical research, on the one hand, and the evolution of homeopathy, on the other, are leading to an increasing degree of convergence of the two systems*, which are usually regarded as alternatives. An open-minded scientific approach to homeopathy can thus be a source of major surprises and of fascinating fields of investigation for both the medical practitioner and the biological researcher. This study aims at comparing certain aspects of basic research and homeopathy, according to a methodology firmly rooted in the practices of general pathology. The ideas and experience reported here are thus an attempt to construct a common ground or, at any rate, a dialogue between medical systems with very different histories and conceptual bases.

A widely held view among doctors is that there is no convincing proof of the efficacy of homeopathy, which is regarded essentially as a commercial ploy exploiting the placebo effect. This view is based on the existence both of the placebo effect and, unfortunately, of various forms of commercial abuse and exploitation. Another common way of viewing homeopathy tends to class it alongside other alternative practices such as touch therapy, herbalism, and oriental medicine.

As we see it, such attitudes fail to grasp all the complexity and reality of the phenomenon, particularly owing to the fact that they are often expressed without a thorough review of the literature available on the topic. The fact is that the published literature in the sector proves by no means easy to retrieve in our libraries, the subject is not taught in faculties of medicine (with only a few exceptions) and, what is more, such limited and often inaccurate information as manages to filter through, mainly via the pharmaceutical companies, tends to pass largely unnoticed amidst the plethora of data, news, and messages in which doctors and researchers in the biological field today are literally submerged.

The main reason for this paucity of information on homeopathy among the public at large lies, however, in the almost total lack of communication between medical systems viewed on both sides as alternatives. This lack of communication has both historical and socio-economic roots, and is influenced by terminological and lexical difficulties, as well as by epistemological problems (relating to the process of acquiring scientific knowledge) which will be extensively illustrated here below. Homeopathic experience and literature have often been relegated to a self-contained, self-sufficient world which at the same time proves difficult to judge according to the categories of modern medicine.

This situation today is slowly but steadily changing. In February 1991, the British Medical Journal published a paper entitled Clinical Trials in Homeopathy, produced by researchers from the Department of Epidemiology of Limburg University (Netherlands), and reviewing 107 publications on controlled trials in homeopathy [Kleijnen *et al.*, 1991]. Despite the fact that most of the trials were of poor quality, the authors of the review article (not themselves homeopaths) claim to have been amazed at the bulk of positive evidence found in these trials, and suggest there is an urgent need for a major effort to glean further evidence by means of well designed trials in strict double-blind conditions. It is therefore not true that there are no serious controlled trials on homeopathic medicine, though it must be admitted that such trials are too few to allow any very firm conclusions to be drawn [similar conclusions in Linde *et al.*, 1997; 1998].

One of the aims of this work is precisely to present an overview of the literature on clinical and basic research relevant to an understanding of homeopathy. The search for such literature proved fairly painstaking and time-consuming, and the result therefore probably cannot claim to be complete or exhaustive, though it certainly represents a valid sample of studies conducted in the past and of those currently in progress. We often had to ask the researchers concerned directly for reference material or to consult the volumes of the congress proceedings of homeopathic associations or

of the International Study Group on Very Low Dose and High Dilution Effects (GIRI). The overview emerging is that of an expanding sector, where, however, the groups involved in serious research are still few and far between in relation to the size, scale, and importance of the issues to be tackled. The current state of the art in homeopathy thus strongly prompts the conducting of further studies and trials to establish whether significant effects of homeopathic remedies can be unequivocally demonstrated, while, at the same time, *there is a need for a theory or, at any rate, for viable hypotheses, to provide reasonable explanations* for the effects observed. What clearly emerges from the above-cited review by Kleijnen and coworkers (and also from joint discussions on the topic) is that *the subject of the efficacy of homeopathy can hardly be tackled without providing some plausible explanation as to its mechanism of action*: "The amount of positive evidence even among the best studies came as a surprise to us. Based on this evidence we would readily accept that homeopathy can be efficacious, if only the mechanism of action were more plausible" [Kleijnen *et al.*, 1991, p. 321]. The attempt to construct a plausible model of the mechanism(s) of homeopathic action is the main aim of the present work.

The scientific validity of a therapeutic method does not depend so much on its success rate as on the fact that the clinical result should be consistent with a pathophysiological, biochemical, and pharmacological theory or rationale. It is only through patient, unrestricted, and methodical research conducted on several planes—clinical, laboratory, epidemiological, and physicochemical—that we shall be able to shed light on the many issues which so far remain unsolved.

In future, the study of the scientific basis of homeopathic medicine will have substantial repercussions on the world of homeopathy itself, which is divided into various distinct schools often in conflict with one another. In all probability, this fragmentation and the impossibility of settling doctrinal disputes is almost certainly due to the total lack of a scientific theory. This not only has an adverse effect on results but also seriously compromises any possible future development in this sector of medicine matching up to the quality standards required today, and capable of coping with the new diseases emerging. Our intention here is not so much to discuss the pros and cons of the arguments put forward in these disputes, which mainly have to do with clinical methodology, as to review from a modern standpoint the basic principles such as the *law of similars* and the *principle of dilution/potentiation* which are accepted by all schools of homeopathy.

The various chapters of this book examine different aspects of the problem, seeking to expound the data and theories already figuring in the published literature, sift them critically and, where possible, propose areas of

common ground and working hypotheses. Our study begins with a summary of the main concepts underlying homeopathy, examining the basic principles and history from the origins to the present day (Chapter 2). Since it is not the aim of this study to provide a practical manual for learning about homeopathy, we have confined our account to essentials.

Chapter 3 addresses the empirical and clinical evidence suggesting that homeopathy is really effective and that this efficacy is not simply definable as a placebo effect. Though such evidence to date is clearly poor and only very preliminary in both qualitative and quantitative terms, particularly if judged using the touchstones of conventional medicine, the explanation based solely on the placebo effect is steadily losing ground, while at the same time there is a growing demand for some kind of theory, model or explanation in modern pathophysiological terms.

Like any scientific theory, hypotheses regarding the mechanism of action of homeopathy can only be based on experimentation or on other currently accepted theories. A substantial body of experimental evidence (Chapter 4) has been obtained in *in vitro* cells or in animal models according to the accepted methodologies codified by conventional science and by western biomedical reasoning. Experimental studies of this type, therefore, cannot be contested as being non-scientific (which would be a contradiction in terms), and the results can be read, discussed and interpreted according to the paradigms used for any other subject of investigation. Admittedly, many studies published to date may fail to prove convincing because of their poor quality, but, in any case, they are part and parcel of the overall frame of methodological and conceptual reference of modern science. The debate regarding the quality of trials is not confined merely to homeopathic medicine.

In an attempt to construct a new explanatory model of the action of homeopathic drugs, the notion of the biological *complexity* of the regulation of homeostatic systems has been introduced. Complexity in biology and in medicine is illustrated in Chapter 5, which deals at great length with the most recent developments in knowledge in the fields of inflammation and cancer. Though the treatment of this subject, rich in biochemical and biological detail, may not seem to have any direct bearing on homeopathy, it will be seen that it is precisely from our current scientific knowledge that any possibility of a reasoned appraisal of the potentiality and the limits of homeopathy (as, indeed, of any other therapeutic method) is beginning to emerge.

On the strength of the experimental studies available and with the aid of these new conceptual instruments, explanatory hypotheses will be synthetically elaborated for the law of similars, the cornerstone of homeopathy

(Chapter 6), and for the principle of dilution (Chapter 7). The new conceptual approaches which will be introduced here represent an open frontier in the future of medicine and rest both upon physical and mathematical theories and upon recent advances in immunological and pharmacological theories. We are entering here into the sphere of models of complexity, chaos, fractals, quantum physics, coherence phenomena, electromagnetic phenomena, and the relationships between homeopathy and acupuncture. These new standpoints for viewing homeopathy will make for a greater understanding of the phenomenon in rational terms.

As regards the "*law of similars*," which is unquestionably the cornerstone of homeopathy, we present a model based on analysis of the functioning of homeostatic biological systems and cellular receptors. The subject is developed analytically and consequentially in a series of stages starting from the functioning of homeostatic systems and ending up with analysis of the pharmacologically active ingredients of homeopathic solutions. In a nutshell, it is claimed that homeopathic remedies activate the homeostasis control systems via receptors other than those for endogenous mediators, but which achieve the same effect as the endogenous mediators themselves, i.e. they cause resumption of production of regulatory signals and thus activate a negative feedback mechanism in relation to the spontaneous progression of the disease process. Homeopathic drugs are thus thought to act as substitutes for an endogenous regulatory signal which, for various reasons, may be inadequate or ineffective because the system is no longer sensitive to it, being "blocked" by the disease itself.

As regards the possible clinical effects and, according to a number of groups of investigators, also the possible biological effects of highly diluted solutions, this clearly goes beyond the bounds of classic pharmacology. Here there is less scope for certainty and more for hypotheses which, however plausible they may be, still require clear, objective substantiation. The scientific research data so far available can only partly explain what homeopathy claims to achieve. The essential items in our treatment of this topic are the following:

- a) The physical properties of water are still in many respects unknown.
- b) It is by no means absurd to think that information can be stored in water in the form of vibrational frequencies of molecular dipoles ("*superradiance*") or in the form of "*hollow hydration shells*" (or "*clatbrates*").
- c) There is evidence that the treatment of pure water with electromagnetic waves endows it with new physicochemical properties which may be conserved for many days.
- d) Highly sensitive subjects can present allergic manifestations to contact with water treated with electromagnetic frequencies.

e) According to Voll's electroacupuncture, a highly diluted homeopathic drug may restore the electrical conductivity of the skin over the acupuncture points if such conductivity has been deranged as a result of disease.

f) There is evidence that many types of cellular receptors and enzymes are activated or inhibited in various experimental systems by the application of low-frequency electromagnetic fields.

g) There is some preliminary evidence demonstrating a homeopathic effect not only of solutions but also of closed ampoules containing solutions and placed in contact with the system to be regulated (human or animal).

In the text these concepts are expounded systematically, though in hypothetical form. Science, however, should not be afraid to draw up hypotheses, even daring ones, if they lend themselves to experimental verification or invalidation.

This study is targeted mainly at doctors, whether homeopaths or otherwise. Homeopathic doctors will find stimuli in the book for a more thorough investigation into the biological basis of the therapeutic system they adopt. The technological spirit of our age demands explanations. In this day and age, when homeopathy still often comes under attack as being "nonscientific," the data and theories reported here may constitute an updated instrument for documentation and discussion. The authors also hope that the line they have taken in investigating the basis of homeopathy will lead to an increasing measure of confidence in the possibility, even in this field with its many mysterious aspects, of using a rational approach and a scientific method capable of contributing towards keeping this clinico-therapeutic method as far away as possible from unscrupulous forms of exploitation which have nothing to do with the practice of medicine.

Nonhomeopathic doctors may find the book useful as a first approach to the problematical issue of homeopathy, viewed not as an alternative but according to a perspective which, at least in many respects, is consistent with the tenets of modern biomedicine, in which they (like the authors of this work) have been trained and which they regularly abide by in their day-to-day practice. Homeopathy is a practice which came into being and gained widespread notoriety "too early" in the history of medicine, at a time when it was impossible to provide any kind of explanation for it. Since, however, it is a form of empirical medicine, it cannot fail to contain elements which are essentially relevant to the realities of human health and disease. It is thus a macroscopic set of "preliminary observations," where strong elements of interpretative and methodological confusion have built up and stratified alongside an undeniable measure of clinical far-sightedness and therapeutic accuracy. To reject everything *en bloc*, as many are tempted

to do, means throwing out the observations along with the interpretations, an operation which may be the line of least resistance, but which is not scientific because unexplained observations have always been the main hive of ideas for research. For these reasons, homeopathy and the critical reappraisal and integration of the various therapeutic systems in general will prove increasingly necessary in medicine in the near future, contributing towards overcoming the difficulties involved in solving complex problems from blinkered, reductive viewpoints.

The ideas and experience reported here thus constitute an attempt to produce a résumé of medical systems usually regarded as alternatives, or at least some form of dialogue between these systems. Such a project promises to be extremely difficult, in view of the vast body of knowledge built up, on the one hand, by homeopathy and, on the other, by modern biomedicine. If to this we add the fact that such knowledge is continually evolving, the task seems well nigh impossible. From this standpoint there is a risk that the contents of the book may discontent the various "specialists." Both homeopaths and scientists expert in their specific fields may find shortcomings and perhaps even inaccuracies at various points of the treatise. The authors, who welcome criticism and correction, trust that any discordance over specific points will not be to the detriment of the main message of this work, which we modestly believe may make a contribution to the current debate on this subject. Though any form of complete synthesis is objectively impossible, there is nothing to prevent us from directing study, research, and reasoning in this direction.