SCIENTIFIC BASES OF HOMOEOPATHY: HOMOEOPATHIC DRUG PROVING AND MATERIA MEDICA AS NEW SCIENCE OF XENOBIOLOGY

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ABSTRACT: Homoeopathy is now facing unprecedented conceptual vacuum since its basic concept of vital force got invalidated by researches in molecularbiology besides its other laws and drug action at ultrahigh dilutions being not consistent with modern scientific theories, although there is strong observational evidence in their support. A new approach to scientific theories is proposed in this series of papers to explain homoeopathic phenomena. The previous paper rationalized vital force as CNS-mediated molecular mechanisms prior and basic to the profound homoeostatic state whose existence characterizes health and perturbation a disease. The homoeopathic materia medica is based on the principle of drug-proving. This paper rationalizes it as new science of xenobiology proposed to study total biological response, comprising subjective plus objective symptoms, of healthy subjects, to xenobiotics—substances present in the *milieu interieur* in un-natural quality or natural components in abnormal concentrations. Xenobiology is a very comprehensive and inclusive concept and also envisages constant updating and upgrading of homoeopathic materia medica along with the advancements in other sciences.

INTRODUCTION

All sciences are based on observation. The observational evidence accumulated over the past more than a century all over the world, is overwhelmingly strong and persuasive in support of the homoeopathic 'art of healing'. This is borne out by this author's more than a decade's personal experience, as a hobby, that homoeopathic drugs do act according to its laws and at ultra high dilutions never before employed in scientific practice. But none of the present-day sciences is conceptually and technically advanced enough to negotiate the homoeopathic phenomena. Homoeopathy itself is now suffering an unprecedented conceptual vacuum because its basic concept of vital force is no longer tenable in view of the latest researches in molecular-biophysics[1-3]. *This author proposes to publish a series of papers suggesting* a new approach to scientific theories for explaining established empirical laws and principles of Homoeopathy and to draw attention of other scientists as well.

As the central theme of these papers the central nervous system (CNS) emerges to play the 'master' role in health and in disease[1-3]. The papers regarded as first[1] and second[2] in the series provided an overview of the pro-

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posed hypotheses. The 3rd paper[3] developed a molecular-biological theoretical analogue for the concept of vital force. This paper proposes a new science of Xenobiology to rationalize the homoeopathic principle of drug proving, from molecular-biological theories. Subsequent papers would elaborate other aspects of the central theme.

HOMOEOPATHIC PRINCIPLE OF DRUG PROVING

According to the homoeopathic 'art of healing',[4,5] that medicine which, in its action on the *healthy human body*, produces greatest number of symptoms *similar* to those in the disease under treatment does also, in suitable doses of potency, cure the disease.

The procedure of creating 'artificial' disease in healthy human subjects by drugs and carefully recording the elicited signs and symptoms with their modalities is called 'drug proving' and is used to construct/produce the homoeopathic materia medica—a collection of real, pure, reliable modes of action of simple and pure medicinal substances on trustworthy and conscientious healthy persons of both sexes and of various constitutions.

In order to determine the exact character of any symptoms or sensation, it is necessary to note its modalities with time, posture, temperature, weather and so on. Larger doses of crude medicines are toxic and the elicited symptoms are of limited utility. The 30th potency on centesimal scale—representing 100^{-30} or 10^{-60} dilution in alcohol—is generally recommended for drug proving[4]. Lower potencies or even mother tinctures could also be used in some cases. Four to six small sugar globules moistened with dilute alcoholic solution and dried, form a dose. If a single dose fails to elicit symptoms for sufficiently long time, several doses at 2 hourly intervals are taken till symptoms start appearing.

Nothing is done thereafter which might disturb the drug action. Repetition of the dose during the period of drug-action is dangerous and likely to implant drug-diathesis which is difficult to cure. Proper course of drug proving improves the health. Hahnemann advised young men to make provings. The symptoms, subjective plus objective, elicited by a number of provers of both sexes and various constitutions/ages added together represent the effect of the drug upon the human race. The ultimates or results of the disease are extrapolated back from clinical observations during treatment of diseases.

The symptoms elicited by drugs may be (a) *common* that is produced by many drugs in many individuals, or (b) *peculiar* elicited by very few drugs in very few persons. These may be (c) *general* that is belonging to the whole body/person, or (d) *particular* pertaining to a particular part of the body.

There is no orthoscientific counterpart parallel to the homoeopathic principle of drug proving. Toxicology studies toxic symptoms of toxic materials accidentally taken in toxic amounts. There is no orthoscience at present which studies non-toxic symptoms elicited by non-toxic amounts of toxic

substances taken or given intentionally for this purpose. The new science of xenobiology does this[2].

THE XENOBIOLOGY—A NEW SCIENCE

The newly proposed[2] science of xenobiology studies the total biological response—comprising the subjective as well as objective symptoms—of the healthy subjects to non-toxic as well as toxic amounts of xenobiotics. Here the term 'total biological response' is all-inclusive. That is, it includes the sensations and feelings; numbness, aches and pains; psychological, mental, emotional and behavioural disturbances; aberrations of intellect, memory and affections; disturbances in appetite, thirst, urine/urination, stool/bowel movements, respiration, sleep, pulse, blood pressure, body temperature, vision, hearing, taste; biochemistry of biological specimens (blood, tissues, secretions, excretions, etc.); bioelectrical/biopotential disturbances in organs, tissues and cells; optical- and electron-microscopic changes at various levels, and so on, together with the modalities of these signs and symptoms with modifying factors like posture, time/period, heat, weather etc.

The scope of the herein used term 'xenobiotic' is very wide and general and also somewhat different as compared to that of the traditional one[6]. Conventionally under the usage of macro quantities, it is synonymous with a 'drug' which is used in the diseased state to suppress, remove or alleviate morbid symptoms. Here it refers to a substance endogenously generated/present in the *milieu interieur* in un-natural form/quality or abnormal quantity and thereby producing disease symptoms, or the one intentionally introduced from outside, in the healthy state, to elicit morbid signs and symptoms of the resultant artificial disease. Like homoeopathic medicines, it may be derived from any source—animals, plants, minerals or chemicals (inorganic or organic). Like haptens and antigenic/allergenic determinants, it may be a part of a larger molecule or organism or particle. It may be a poison (from animals, plants, or chemicals) or a venom (from insects, snakes). It may be a toxin or processed antigen produced in parasitic diseases or an autoantigen causing autoimmune diseases, or an antibody or an antibody-antigen complex. Even a natural component of the *milieu interieur* may behave xenobiotically if its concentration becomes higher or lower than the tolerable normal range for that particular subject at any time. This is borne out by the fact that both hyper- and hypo-thyroidisms associated respectively with higher and lower than normal concentrations of thyroid hormonès are definite diseased states with characteristically distinct symptoms, and so, are the conditions having higher and lower than normal concentrations of glucose in the blood.

It is clear from the above that the biological phenomena or responses grouped under homoeopathic drug proving, toxicology, allergy, hypersensitivity, autoimmunity, immune-response, parasitic diseases, iatrogenic diseases, and so on, are all different branches of xenobiology. This is because the

morbid symptoms in all these cases are associated with causative xenobiotic(s) present in unnatural quality or abnormal (higher or lower than normal) concentration(s). The role of the infective parasites is to generate or introduce pathogenic xenobiotics or deficiency or excess of some natural constituent(s). The autoimmunity is compounded from the xenobiotic disease elicited by the autoantigen and/or autoantibody and/or autoantigen-antibody complex with the primary enzymatic imbalance which gives rise to the first antigen formation.

The xenobiology is thus, a very comprehensive and inclusive concept and covers the homoeopathic procedure of drug-proving[4-5] and also toxicology as its particular cases. Moreover, it envisages the continuous upgrading and updating of the homoeopathic materia medica with the technical advancements in all other sciences. This is important, because Homoeopathy has so far developed only empirically in isolation of the phenomenal developments in other sciences which has led to the present state of unprecedented conceptual vacuum in Homoeopathy on the one hand and to the delay and reluctance for its scientific recognition, on the other.

The value and need of precisely determining and documenting the xenobiotic responses or provings of the newly discovered, synthesized or isolated alkaloids, toxins, antigens, carcinogens, allergens, pyrogens, toxic chemicals etc. can hardly be over empbasized particularly in view of their constituting the materia medica for homoeopathic therapeutics.

MOLECULAR-BIOLOGICAL BASES OF XENOBIOLOGY

Health has been characterised[1-3] by the continuity of profound general homoeostasis via the dynamic equilibrium and functional balance in the chemical, electrical and structural properties/compositions of various cells, tissues and organs of the body. This is accomplished by a delicate and balanced coordination of innumerable metabolic reactions catalyzed by enzymes. The population size and activities of the strategic enzyme-systems control the directions and rates of metabolic reactions. Syntheses of enzyme proteins are controlled by the intra- and extra-cellular signals. The CNS plays the 'master' regulator and controller of endogenous generation and delivery of homoeostasis-regulating signals at various levels. The enzyme-operated system, the signal-operated system, and the CNS-master regulator are interdependent and interconnected into a single whole via multi-way biofeed back/forward dynamic mechanisms. These basic molecular mechanisms, like homoeopathic vital force, pervade the whole organism and mediate all biological functions, sensations and so on[1-3].

If a substance is introduced from outside which is a natural component of the *milieu interieur* and is in tolerable amounts, it will be smoothly metabolized by the existing enzymes without eliciting any biological response. This routinely happens following food intakes.

If the concentration of this natural component is or becomes higher

than the tolerable normal range, the corresponding enzyme system would get overloaded *for sometime* and the symptoms produced would be similar to those of the natural disease in which the same enzymes are deficient. This artificial transient disease would pass off with time.

If the xenobiotic is not a natural component of the *milieu interieur*, the regulatory mechanisms would be set into operation to synthesize the necessary enzymes *de novo* for appropriately modifying and eliminating the xenobiotic and for removing its perturbation from the general homoeostasis. Until then, a biological response will manifest with signs and symptoms of an artificial disease. This explains as to how and why morbid symptoms are produced during homoeopathic drug-proving and thus rationalizes that procedure from molecular-biological theories.

Sensations, feelings and other non-toxic symptoms can be produced with very low concentrations of the xenobiotic. Poisonous substances would require the use of really high dilutions. This is consistent with the procedure of homoeopathic drug proving with 30th potency on the centesimal scale (see above).

Toxic symptoms would be produced by toxic amounts of the xenobiotic taken by humans accidentally or deliberately in an attempt to commit suicide.

Drug-proving is used to record early and short-term symptoms. Long term and chronic symptoms and resultant pathologic tissue changes can be inferred from clinical observations during treatment of diseases with homoeopathic/ultramicroxenopathic drugs[3].

The actual pattern/quality, intensity, duration and modalities of the various signs and symptoms would vary with the quality and quantity of the xenobiotic and also with the subject's constitution, enzymatic make-up and history of xenobiotic exposures. One would therefore expect both inter- and intra-species variations in biological responses to the same xenobiotic. Nay, even one and the same healthy individual subject may respond differently at different times. Only the sum of the various biological responses from a large number of healthy subjects of both sexes and different ages and constitutions should and would represent the response of the human race. This underlines the procedural details of the homoeopathic principle of drug proving.

At the end of the drug-proving experiment the subject is left better equipped enzymatically and hence Hahnemann's advice, though based only on empirical observations, that drug proving is good for health.

As the CNS exercises an overriding regulatory control on general homoeostasis, the subjective symptoms pertaining to intellect, memory, affections, sensations, behaviour etc. acquire high weightage[3].

Presence and potency of the metabolizing/eliminating enzymes have thus emerged to be the bases for a substance to be recognized as 'self'. Because, it is only then that it would not elicit any xenobiotic-response. The same would also seem to be the bases of immunogenic tolerance which may

be *innate* or *induced* according as the strategic enzymes pre-existed at birth or were induced later in life. The drug resistance in parasites is likewise produced via induction of the drug-metabolizing enzymes in them apart from through genetic mutations.

It may be emphasized that the exact molecular mechanisms for the following events composing the xenobiotic response are not yet clearly understood: (a) detection, positive recognition of the xenobiotic, (b) activation of the CNS-master regulator with and without the xenobiotic crossing the blood-brain barrier, (c) cascaded generation, and action of regulator signals and enzymatic machinery, and (d) elimination of the xenobiotic and of homoeostatic perturbations. The available pointing evidence from the literature has been reviewed earlier[1-3].

However, the following considerations are relevant here:

(a) The xenobiotic responses are invariably associated with mental symptoms and sensations requiring CNS-mediation. The xenobiotics, therefore, must somehow affect the CNS.

(b) The xenobiotics which, after absorption or entry into the vascular circulation, can cross the blood-brain-barrier, could directly act on the CNS; those which cannot cross this barrier could affect the CNS through the endocrine-pituitary-hypothalamus channel.

(c) The CNS could also be affected by the xenobiotics via their action(s) on the chemiceptors or polymodal nerve endings which are known to have neuronal connections with the CNS[7].

More than one of the above three modes of xenobiotic action could also operate in some cases.

(d) In addition to the CNS-mediated 'general' symptoms the xenobiotic responses are also associated with 'particular' symptoms elicited by their actions/effects on the particular tissues and organs. Some of these involve neuro-muscular pathways while others require actions on local cells and tissues.

(e) It has been found under homoeopathic drug-provings that different xenobiotics have characteristically distinct patterns of response at least in part and that a large number of them act on the same site, say tongue. This requires the xenobiotic (i) to enter the target cell directly or in association with a trans-membrane carrier or through endocytosis preceded by a binding with a membrane receptor[8], or (ii) to perturb the adenylate cyclase molecules preceded by a binding with a membrane receptor and migration[9], or (iii) to communicate with the interior of the target cell through some other mechanism preceded by a binding with membrane receptors[10].

Enormity of the number of xenobiotics existing in nature which cannot readily cross the membrane suggests considerable flexibility and adaptability in the conformation and folding capacity of the membrane receptors mediating their xenobiotic response.

(f) It takes some time, even hours or days, for the symptoms to appear

after the xenobiotic dose, suggesting, mediation of slow processes involving chemical signals, synthesis, release and actions. This is consistent with the experimental evidence from the published literature reviewed earlier[1-3].

CONCLUSIONS

(i) Homoeopathic 'art of healing' and the related phenomena are established facts for which present-day orthosciences have no provision/explanation. The concept of vital force still so basic to homoeopathic theories is no longer tenable in view of the post-1960 researches in molecular-biophysics, creating an unprecedented conceptual vacuum in Homoeopathy. This justifies a new approach to scientific theories presented in this and other papers in the series.

(ii) From the molecular-biological theories developed earlier, a new science of xenobiology is herein proposed which studies the total biological response of healthy subjects to xenobiotics.

(iii) Conceptual scope of the term 'xenobiotic' used here is very wide and general. Conventionally it signifies a drug used in diseased state to remove morbid symptoms. Here it refers to a substance of un-natural quality or a natural component in abnormal quantity, *used in healthy state*, to elicit signs and symptoms of the so created artificial disease.

(iv) The xenobiology is a very comprehensive and inclusive concept and covers the homoeopathic principle of drug-proving and also the science of toxicology. It also provides for continuous updating and upgrading of the homoeopathic materia medica along with the advancements in other sciences.

(v) Presence and patency of the metabolizing enzymes have emerged to be the bases of (a) 'self' recognition, (b) immunogenic tolerance, (c) drug resistance in parasites.

(vi) The 'positive recognition' of xenobiotics necessitates for the xenobiotic-receptors to have, (a) unlimited flexibility and adaptability of their receptor conformation to suit any xenobiotic, (b) distinct and reproducible specificity of the so adapted conformation to a particular xenobiotic, and (c) mechanisms for transmitting specific xenobiotic-information to the interior of the target cell via entry and/or release of intra-cellular second messengers like cAMP, cGMP.

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Publication of the journal is continuing to be delayed as a consequence to strike in press in Dec.-Jan. last. Every effort is being made to regularize the position and it is expected that the issues will come out again in time within a few months.

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