A SCIENTIFIC APPROACH TO HOMOEOPATHY

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One of the charges levelled against Homoeopathy is that no attempt has been made to establish its theories scientifically. On the face of it the charge looks justified because the method of practice has enormous arbitrariness with varying assertions on dosage, potency and repetition. The provings on which the medication is predominantly based has remained stagnant over the centuries. Apart from a few chemicals like sulphur, phosphorus, sodium chloride etc. bulk of the homoeo. drugs are herbal or animal extracts. The plant extracts have further specifications about the part of the plant to be used (e.g. root, flower, fruit or leaves) and the season of the year (spring, monsoon or summer) when it should be collected. In the last two hundred years and also owing to difference in locations, changes due to mutations and thereby changes in the characteristics of the medicine are plausible and hence every medicine needs to be proved time and again. I have done it several times and often noted that left- and right-sided actions are not always the same as mentioned in the materia medica. Conceding the fact that potentised medicines are extremely dilute and direct detection through physical properties are not sensitive enough, one should also accept that over the past ten years there has been an enormous stride in the detecting technology.

I would like to point out some of these techniques which are being used in biophysics and biochemistry and how it is possible to check the drug reactions in the living system and the feasibility of its usage in proving the philosophy and theory behind the working of homoeo. drugs as given by Hahnemann.

Some of the characteristics in the working of a homoeo. drug are typically:

(i) Very fast action, at time so fast that it looks a magic or a miracle. It happens when the symptoms match and are diagnosed correctly.

(ii) Aggravation or appearance of new symptoms after medication at times. But aggravation is neither necessary nor is it a pointer towards cure as some believe.

(iii) The cure has an oscillatory tendency, i.e. the patient gets better, then reverses, again betters and so on till a stable cured condition is reached.

(iv) A very small amount of medicine is all that is required and sometimes single dose is enough.

(v) Apart from dilution, potentized drugs are said to become dynamic through trituration or succussion. Potentisation is the chief characteristic of this system of medication.

These are the observed statistical behaviour and any theory or experi-

ment should be in a position to clarify this. Some of them, e.g. the oscillatory nature before stability and aggravation are unique to a living system hence probably the testing requires the presence of a living system to give a concrete result.

In testing the efficacy of pharmacological drugs magnetic resonance methods are used frequently. These methods are sensitive to structural changes and physiological changes such as in a diseased cell or tissue. Hence this resonance technique is gaining favour in medicine and diagnosis compared to x-ray and ultrasonic methods. The relevant techniques are discussed separately in the appendix.

An allopathic drug is assumed to interact with a biological membrane of a cell in a human body to effect its curative action. Hence the drug permeability and its transport across the membrane are the necessary parameters to be detected. The cell membrane consists of macromolecules like proteins, phospholipids and carbohydrates. The lipids have a bilayer structure and proteins are inside or on the surface of the bilayer. The lipids are very versatile having polar and apolar parts, hydrophylic (waterlinking) and hydrophobic (waterhating) parts. The lipids have a liquid crystalline structure and undergo a phase transition below a certain critical temperature, T_m to an immobile 'gel' phase. The mobility of membrane is said to correspond to permeability across the membrane. The phase transition is studied by electron spin resonance (ESR) technique. To use ESR, one should have a free electron in the system. Since lipids do not have a free electron, a free radical is externally attached to the lipid and this is called spin-labeling. When a drug say propranolol or vitamin E is incorporated in the membrane, the fluidity of membrane is increased as shown by the lowering of T_m. This implies that the drug is permeating into the cell membrane. Another method for measuring fluidity is by measuring relaxation times of carbon, hydrogen or phosphorus spectra by using FT-NMR (see appendix). If the drug acts on a receptor site it is transported fast across the membrane. In this case the signal intensity of the spin-labeled ESR spectrum decreases with time because as the drug permeates through the lipid bilayer it reduces the spin label. Thus, the measurement of ESR phase transition, signal height with time and spectra, reflect on the drug-membrane interaction. Lipids in the above experiments are derived from eggs. Penetrability of a homoeo. drug can also be monitored in a similar way using the above technique. Silica, Hepar sulph. and Natrum mur. are said to penerate well because they bring out abscess and water out of the system respectively. But, permeability of the drug through membrane does not necessarily indicate a cure. To know the curative factor in the metabolism one has to take a biochemical approach. For a homocopathic medicine, I can suggest the following techniques.

To start with, it is essential to know why trituration of a medicine in lactose or the succussion of a tincture in alcohol is important for the action

of the medicine. Chemical shift and coupling constants of certain proteins are available in lactose and sucrose. Alcohol is fermented sugar. Polysaccharide (a carbohydrate) is one of the macromolecules important in the biological functioning of a 'living' molecule. These are long chains which fold themselves to become compact. The biological function is very much dependent upon this three dimensional structure. Any perturbation in this can be investigated by high resolution NMR (see appendix). Whether trituration and/or succussion from polysaccharides, or make the molecules polar can be investigated by this means. The formation of a polymer can also be detected by measurement of relaxation times. There are also other physical methods available for the detection of polymerisation.

Next comes the testing of the role of the medicine component in the lactose matrix. Though present in minute quantity compared to the bulk of lactose (I am restricting myself to triturated medicines, biochemic and homoeopathic, but the testing technique should also hold true for alcoholic base, with a slight modification). The medicine component has a distinct action as obvious from the fact that this alone would distinguish the action of one medicine from the other and has been observed to be that way. One pill of Sulphur 30 acts differently from one pill of Nux vomica 30 in a human body though both of them have a predominant component of lactose. Since the drug content is in small amount, I feel that a biochemical approach of testing would be more sensitive because the living apparatus of a human body amplifies and the action in it could be different from action outside. The following methods could be tried.

A pathological way of determining the antibiotic for an infection is to prepare a mold or culture out of some discharge (urine for urine infection, saliva or sputum for tuberculosis and so on), and to observe whether the drug is capable of dissolving it. A homoeo. drug can be tested similarly taking only the specifics, e.g. Cantharis for urine infection. Some of the nosodes like Influenzinum, Tuberculinum, Bacillinum etc. are ideally suited for this trial but this is more in the realm of Isopathy and does not tell much about the law of similars. Nevertheless, the effect of the drug and effect of potentisation might be possible to surmise.

An antigen (any disease causing product, say malarial) could be injected into a few rabbits. In the serum taken out the number of antibodies produced can be counted. After feeding the curative drug, say China or Natrum mur, again number of antibodies in the serum can be counted and compared. Here it is worthwhile ot point out that many of the higher molecular weight polysaccharides are said to be strongly antigenic, i.e. they lead to production of antibodies when injected into suitable animal[1]. Such an antibody, which

1. This statement is taken from *Principles of Biochemistry* by A. White, P. Handler and E. L. Smith. In Boericke's *Materia Medica*, Sucrose is referred to as antigenic and capable of curing gangrene and putrified states. Triturated sac lac is used as medicine by Kent.

reacts specifically with the antigen that elicited its production also often cross-reacts with polysaccharides of similar structure. I have already mentioned that potentized lactose could be a polysaccharide.[2] I can think of a biochemical reaction of the type Lactose + drug

$$\xrightarrow{\text{Activator}}$$

Antigen + Antibody → (Antigen + Antibody protein complex) later dissipated → by cells through other reactions.

Antibody protein may or may not be in the left side. The exact nature of the reaction could be modified after knowing what exactly happens to the lactose drug molecules on trituration or succussion[2].

The antigen and/or antibody produced due to it interacts with the triturated lactose and minute quantity of medicine in it could act as a catalyst or just determine the specific locale! The resultant product might be a complex of protein and could act as an inhibitor when the action of the disease is over and to control the direction and rate of reaction. An inhibitor is opposite of a catalyst and it reverses the reaction. This kind of catalyst-inhibitor involving reaction can explain the oscillatory pattern of the cure. When the catalyst is more, i.e. medicine content in the drug more (in lower potency or for higher dosages) the reaction might become too fast and disease symptoms could aggravate. If the medicine is more, one can also expect new symptoms corresponding to its provings. Pathologically disease causes are diagnosed by the allopathic doctors through the different tests whereas a homoeo. practitioner does it by symptoms. The provings on a healthy body probably points out empirically the locale and specific action of a medicine. Thus we get a proof or justification for the law of similars. This kind of reaction can also explain a miraculously fast cure when symptoms match (that means just the right antibodies are produced and the right type of catalyst has been chosen[3, 4].

Since the action is through the antibodies aroused in the live body we are automatically led to conclude in consonance with Hahnemann's philosophy that the "vital force" (i.e. the immunal force) is the one which is

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2. NMR spectrum at 500 MHZ has shown that potentised lactose (triturated mechanically in a ball mill for over two hours) does not show a polymerized spectrum nor does it differ in any way from unpotentised lactose (chemical shift or splitting).

3. It is pointed out by our biochemist that generation of antibody is a slow process taking days and weeks. Secondly, present pharmacology has not succeeded much in producing drugs which are active only in a specific locale. Viewed in their angle this would be a shortcoming in the argument.

4. Very fast responses are expected when the endocrine glands are affected. These secrete fast on message from central nervous system, e.g. secretion of adrenalin in fear or in stress.

boosted to effect the curve. Again, when the vital force is low, i.e. the patient has a low antibody generation one should start with a medium potency (low would mean aggravation through increased catalytic action). Hence one can infer that minimum dose of a medicine leads to a controlled cure with least aggravation or upset in the system. If no cure is gained after the administration of a medicine, it would imply a low antibody generation or a low catalytic action. A low catalytic action can be bettered by increasing the medicine content that is by going to a lower potency rather than increasing the number of pills (i.e. dosage or quantity). This has also been advocated by Hahnemann for chronic diseases. The dominant action of mental nature on physical complaints and vice versa is because of the control of the central nervous system over all functions of the body including the generation of antibodies and antigens.

Experimentally how does one observe the reaction that is taking place? It is difficult but it might be possible through spin-labeling technique which tests the reaction step by step. One can also do it by marking the drug with radioactive isotope, say C^{14} and then following the pathway or through C^{13} NMR *in vivo* in an animal. Indirectly, structural changes (biological functions very much depend on these) could be monitored through relaxation time changes, and spectral changes in NMR. In 'NMR imaging', image of the tumored part and locale can be viewed on the screen. For a fast acting drug[4] it might be possible to view the change in the screen. Similar to the above, in topical magnetic resonance a live body is inserted into the magnetic field and metabolic changes are observed in the NMR spectra. To summarise, the true nature of the reaction could be ascertained by these methods. The observations and the inferences lead me to believe that the reaction of the medicine in the body is biochemic, catalyst-inhibitor type of reaction. The curative action might be arising through the generation of antibodies. The principle is like that of vaccine but there the similarity ends, since administration is not in bulk doses like vaccine.

In conclusion, I would like to say that many of these facilities like high resolution NMR, FTNMR and ESR are available in this country and there are many groups studying the working of biological molecules. There are many homoeopathic colleges with enlightened and experienced staff and private practitioners who can come together and have a planned programme on research over new medicines, obtain statistical provings and establish the working and philosophy of Homoeopathy.

APPENDIX

TECHNICAL TERMS AND DETECTING SYSTEMS

Standard radiography (x-ray) is unable to discriminate among overlapping structures. This deficiency was remedied by the development of x-ray computerized tomography, or CT scanning, a technique in which x-ray data recorded from many different directions are reconstructed mathematically to yield cross-sectional views of selected regions of any part of the body. The images it provides are basically anatomical.

In ultrasonic CT either the (sound) velocity or its attenuation through different parts are measured. Its usage is limited.

In magnetic resonance techniques the property of some nuclear spins to act as a small bar-magnet is utilized. In the presence of a magnetic field these nuclei tend to align themselves parallel to the field. They also interact with other nuclei in the system. The interactions are reflected in the resonance property. Hence the study of resonance spectra yields information on the interactions, and hence the cells, tissues etc. and whether they are diseased or normal. The shape, widths and position of the spectra will reflect on the curative action of the drug, since it has to be through interactions. As hydrogen, carbon, nitrogen and phosphorus are the chief constituent atoms of biomolecules these are nuclei usually studied. In Ft-NMR (fourier transformed NMR) power applied is in pulses and relaxation time, i.e. the time taken to come to equilibrium after the field is switched off, is studied through decay of the pulses.

High resolution NMR, as the name implies, has a very high homogeneous field and is able to resolve and analyse the spectrum to maximum effieiency.

In ESR (electron spin resonance) the resonance is through electron spins. It is essential that the material has a free electron available. Since the macromolecules do not contain any free radical, they are attached externally and this method is called spin labeling.

In topical magnetic resonance (TMR) and NMR imaging the external field is purposely kept inhomogeneous to eliminate skin depth problem, since whole or part of living body is inserted into the field to study the metabolism and biochemical actions and reactions *in vivo*. The magnet gap is kept sufficiently big. This technique is gaining ground in clinical diagnosis and cure.

In radioactive tracer techniques an isotope say C^{14} is incorporated in the molecule in order to follow or trace the metabolic pathways of specific portions of their structures. In addition the isotopes labeling technique is useful in tagging active sites of large molecules, e.g. enzymes. They are particularly valuable in the study of drug molecules which could be similar to body constituents.

Magnetic resonance methods are in great favour as they do not add extraneous substance into the system, no harmful radiations and have a capacity to distingnish the diseased part from a healthy part.