A Working Hypothesis for Homeopathic Microdiluted Remedies

by

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Summary

A three-step hypothesis to explain the specific organizaton of molecules of the solvent in homeopathic microdilutions which can maintain the properties of an initial substance not effectively present is herewith introduced, e.g. for the case of pharmaceutical substances that need grinding before their dilution.

First: We assume that during grinding and the first sequential dilutions characteristic small clusters (aggregates of a small number of molecules) of the diluted substance are fonned. They are surrounded by shells of organized hydrogen-bonded molecules of the solvent (called clathrates).

Second: Because of the applied forceful succussions and the different inertial properties, small clusters move out of their clathrates. A new clathrate then forms around each relocated small cluster, and an additional clathrate (mantle clathrate) is formed round the initial clathrate (now called the core clathrate). which has become hollow, having lost its small cluster.

Third: At this state, no effective amount of substance is present. The role of small clusters in dilutions and succussions to follow is totally influenced by the compact structure of the core clathrate, which possesses an interior void, characteristic of the properties of the initial substance. That is, due to forcefully applied succussions and different inertial properties, core clathrates move out of their mantle clathrates and stimulate the formation of new mantle clathrates. Likewise, old mantle clathrates become new core clathrate and stimulate formation of their own mantle clathrates. As succussion and dilution continues, the process is repeated.

Important parameters involved during the preparation of a homeopathic remedy arc 1) the applied force and its fixed direction in each succussion to separate small clusters from their clathrates or core clathrates from their mantle clathrate; 2) the time between two successive succussions to allow the rcorgani7ation of the molecules of the solvent to form new clathrates and 3) the number of successive dilutions necessary to reach the desired density and size of hollow clathrates which resemble the properties of the initial substance.

Introduction

After many successes in specific cases, homeopathy has attracted a lot of attention and tends to become accepted fact [1]. A significant percentage of physicians in the USA and Europe consider themselves homeopaths. Despite this impressive number, however, even to date few medical professionals or consumers know anything about the structure of the homeopathic remedy, which is the subject matter of the present communication.

The homeopathic pharmaceutical process called "potentialization" refers Lo a method of sequential dilutions and succussions (each time between two sequential dilutions the mixture is vigorously shaken a specific number of times, e.g. 40 times). Many physiological processes are certainly controlled, or affected, by minute quantitics of substances. However, Lhis does not explain the action of potencies diluted far beyond the Avogadro's number, e.g. $1/10^{100}$ (called microdilutions). Recently, researchers suggested that the therapeutic properties of the remedy in the latter case lies in the solvent [2) rather than in the diluted substance.

Various technique s have been employed to demonstrate that there arc physical differences between potentized dilutions and the solvent itself. These studies have included the use of ultraviolet spectra, conductivity measurements and infrared analysis, surface tension measurement, nuclear magnetic resonance spectroscopy and other methods (3-9].

Several theoretical attempts to explain the unusual behavior of microdilutions suggest certain organization [2,11] of the water molecules (polymerization of the solvent). However, there is no convincin g explanation for the specific organization of solvents which is able to main lain in these dilutions some properties of the initial substance, which is no longer effectively present. The purpose of this work is to contribute to an understanding of microdilutions by using some principles of physics. Specif1cal\y, we introduce the following three-step hypothesis.

Step One

We assume that during grinding and the first stages of dilution small clusters [11-14] of the substance are formed (i.e. aggregates with a small number of molecules). As known from physics, these clusters possess properties distinctly different from the bulk properties of the substance as a result of differences in equilibrium geometry and electronic structure. The grinding of alkali metals used in homeopathy and their further dilution into solvent may cause the formation of small clusters, which thereafter exhibit substantial stability and possess the characteristic shape of the specific substance, with highly symmetrical fonns [15-17]. Up to this stage, the succussions used in homeopathy play no role.

For better understanding of our three-step hypothesis, we take, incombination with Figures 1-3, the example where the substance on which the remedy of interest is based is sodium, and the small clusters formed are composed of, let us say, 40 molecules (atoms). According to Reference 16, each small cluster of Na^{40} is made up of sequential concentric shells of 2, 6, 12 and 20 atoms (see Fig. 2 of Ref. 16). Specifically, the outside shell is a dodecahedron, as shown in Figure la.

Molecules of the solvent (water) surrounding each of the small clusters now form bonds with one another (e.g. hydrogen bonds) [18), giving rise to a shell with a shape similar to that of the

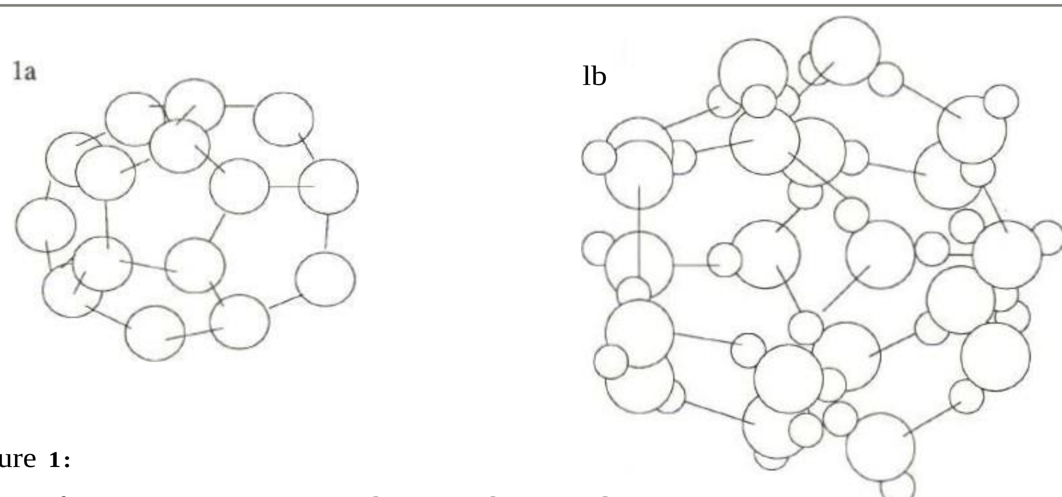

Figure 1:

Stages of Step One in preparing a homeopathic remedy.

(a) Dodecahedron formed by Na^{20} atoms as outermost shell of Na^{40} small cluster according to Figure 2 of Reference 16.

(b) Dodecahedral small cluster of water molecule s interacting with hydrogen bonds, called clathrate, surrounding the small cluster from (a).

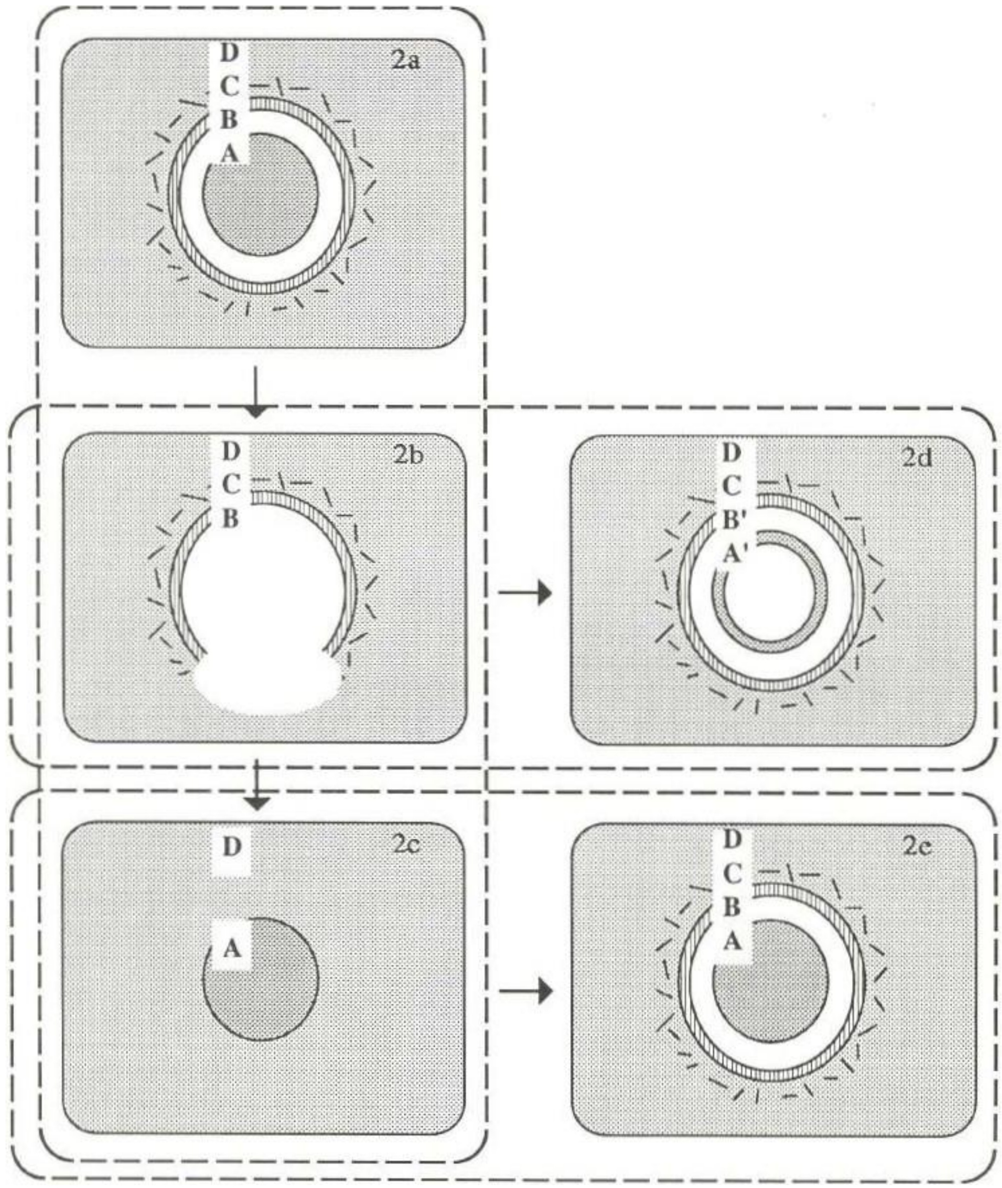

Figure 2:

Stages of Step Two in preparing a homeopathic remedy.

Letters A and B stand for the small cluster and the clathratc of Figures la and b, respectively. Leucr A' and B' note the shrinked-compact coreclathrate and the mantleclathrate, respectively. Leuer Cnotes the semi-organized incompatibility layer of water in between the organized layer of water B and the unperturbed water D.

small cluster, having the small cluster as its core. That is, these water molecules form what is called a clathrate [19] structure which, in itself, is a small cluster of water molecules.

Figure 1b shows the clathrate around the dodecahedron of Figure la, which again has a pentagonal dodecahedron structure and whose site is restricted (at this stage) by the size of the small cluster rather than by the strength of hydrogen bonding. As a result of this restriction, we have a loose clathrate.

In Figure 2a the small cluster (A) and the clathrate (B) arc shown together in schematic fo1m inside the unperturbed water (D). Between layers (B) and (D) of this figure and the figures to follow, an incompatibility layer (C) of semi-organized water molecules is seen. In general, the situation shown in Figure 2a presents the solute-solvent system in a rather early stage of remedy preparation.

Step Two

If the subsequent succussions arc forceful enough, small clusters with an inertial behavior different from the surrounding loose clathratcs overpass the cohesion forces and move to other positions (Figure 2c) outside thcirclathrate shells along the direction of the external force. At each new position for each small cluster, a new loose clathrate is formed (Fig. 2c).

Immediately after each small-cluster relocation the corresponding clathrate shell ofthe water molecules is partially broken (Fig. 2b). However, neighbor molecules of the solvent (water) try to fill the empty space inside the broken clathrate in competition with the shell trying to repair itself (helped by its high symmetry [19]) to its previous form where the small cluster was ils core. Because of this competition, some clathrate shells <ire destroyed while some others completely repair themselves (Fig. 2d), possessing a hole (void), empty or not, in their interior in a similar form as the relocated small cluster characteristic of the diluted substance. As the succussions continue, more and more such holes are created in the solvent. At this stage, the dimensions of the repaired clathrates (and consequently of their interior holes) are strictly determined by the strength of the hydrogen bonds and not by the size of the small cluster (as before). This means that their interior void may be smaller than that of the initial small cluster (Fig. 2a), which is no longer present. As a result of this contraction, the repaired clathrate in Figure 2<l has a more compact structure than in Figure 2a. Another mantle clathrate is now formed outside this core clathratc, i.e., the semiorganized molecules in the C layer of Figure 2a and b become organized in the form of a clathrate whose size now depends on the size of the core clathrate and not on the strength of the hydrogen bond alone (Figure 2d). The form of this mantle clathrate is not necessarily the same as that of the core clathrate.

Step Three

Now let us assume that we have a solution with empty clathrates (holes), but having not even one molecule of the initial substance (see Fig. 3a identical to Fig. 2d). In this solution we apply forceful succussions. The role of small clusters of substance is now taken on by the empty clathratcs of water molecules. Their symmetric and compact structure gives them extra stability and, thus, they behave like large complex olecu les, i.e., molecules with a much larger mass and, so, with different inertial properties than regular water molecules or accidental formations of water molecules. Specifically, during these succussions the core clathrate moves into another position outside the mantle clathrate (Fig. 3c), leaving an empty space at its initial position. Then the story repeats itself as in the second step, that is, by repairing and shrinking the broken mantle clathrate, which finally becomes a compact core clathratc surrounded by a newly formed, loose mantle clathrate. These new core and mantle clathrates arc not necessarily identical to the core and mantle clathrates in Step Two. The final stage of this procedure leads to Figure 3d, which resembles, but it is not necessarily identical to Figures 3aand 2d. At the same time, the relocated core clathrate of Figure 3c acquires a new mantle clathratc, i.e., Figure 3c is transformed into Figure 3e, which is identical to Figures 3a and 2d. As the succussions continue, more and more shaped holes arc created in the solvent. Their form and size depend on that of the small clusters of the initial substance, which is actually absent. A sufficient time interval must exist between two sequential succussions in order to allow all necessary orientations and organizations of water molecules involved during our steps 1-3 to take place.

In a brief review of our three-step procedure, we notice that the important parameters involved are (1) the guarantee that small clusters of the diluted substance arc formed, (2) the force applied to each succussion which should be able to compensate for the cohesion between a small

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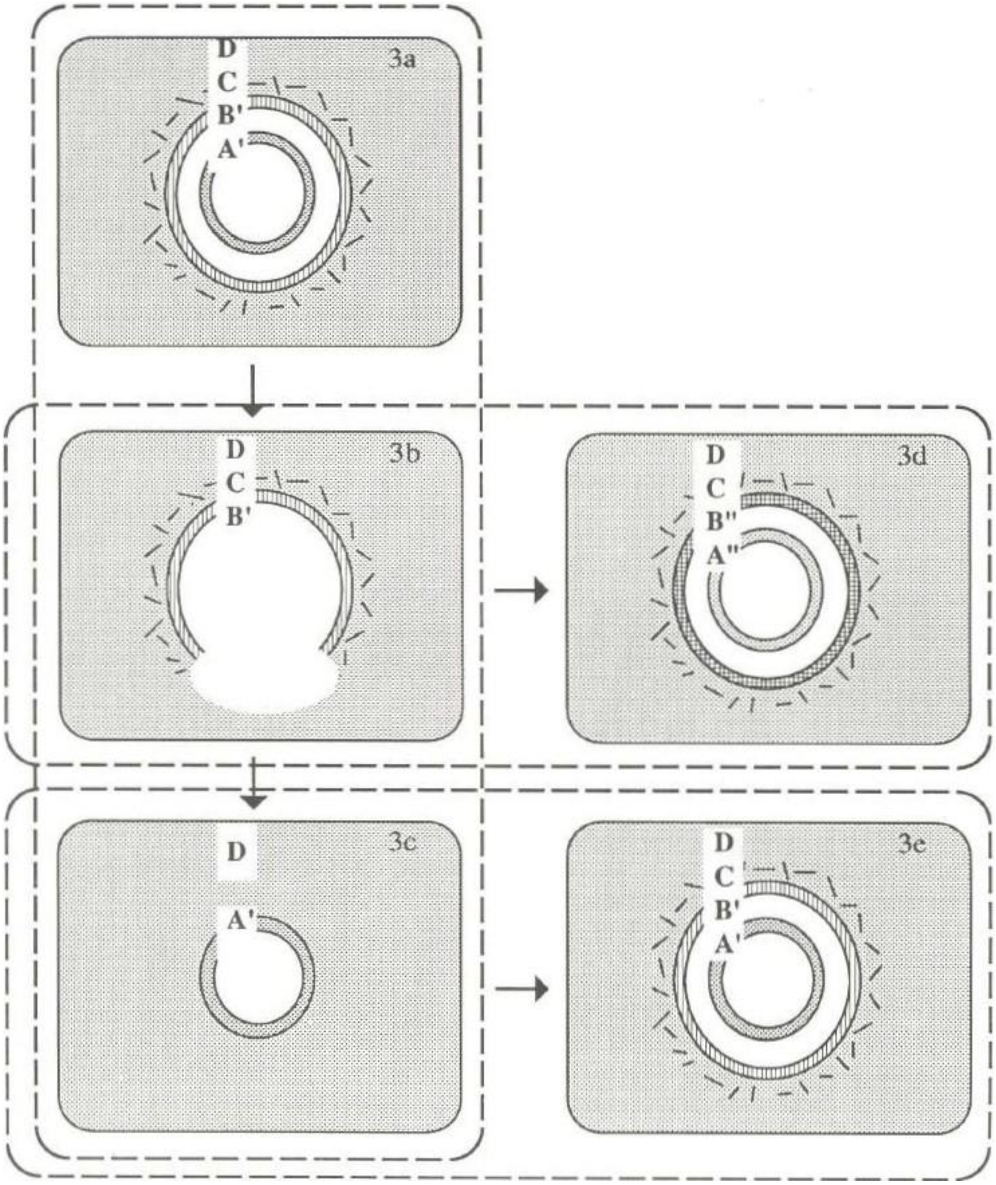

Figure 3:

Stages of Step Three in preparing a homeopathic remedy.

All letters have the same meaning as in Figure 2. Double primed letters A", B" denote structures derived from the structures denoted by letters B' and C of Figure 3b, respectively.

cluster and a clathrate or between a core clathrate and a mantle clathrale, (3) the direction of the force, which should stay fixed (one-way) for all succussions so that each succussion does not destroy the effects of the previous ones, (4) the number of succussions per dilution in relation to the strength of the applied force and to the dimensions of the vessel used during potentialization, (5) the frequency of succussions, whereby the time between two successive succussions must be large enough to permit the formation of the necessary mantle clathrates around the small clusters of the substance or around the core clathrates, and (6) the number of sequential dilutions necessary in order to reach the desired density (and size) of holes in the solvent and, thus, in the remedy.

If our solute (substance) were a noble gas instead of the alkali atom (e.g. sodium) assumed previously, the structure (and to some extent the size) of the small cluster and thus of the related clathrates would be different than the one discussed. That is, the surface structure of the relevant small cluster would not be that of Figure la, but the icosahedral structure shown in Figure 1of Reference 16. If, as another example, our substance were a mixture of alkali metals, then the geometry of related clusters would follow that of Figure l of Reference 17.Thus, we see that some of the properties of the initial substance can be traced by the properties of the shaped holes in the solvent. Inother words, the specific homeopathic remedy resultig from microdilutions of a certain substance may have some characteristic properties of that substance, although it is not physically present, a fact which constitutes the foundations of homeopathy.

While the organization of water molecules in shells around a central molecule (up to three layers per central molecule) or the formation of holes in water are well-known phenomena in the science of Physical Chemistry [20-22), the introduction of the small cluster concept is necessary to explain the symmetrical organization of water molecules (clathrates) and consequently the formation of shaped holes in the solvent exhibiting stable symmetrical forms characteristic of the initial substance. InPhysical Chemistry wc speak about holes and shells in general. Here, wc speak of holes and shells with specific shapes and properties which constitute the basis of homeopathic remedies. For such remedies, the initial physical presence of a substance as well as the formation of small clusters of that substance during grinding and at the early stages of the sequential microdilutions are essential.

The next stage in our effort to explain the mechanism with which potentialization affects the homeopathic remedy is the performance of suitable experiments to verify all steps of our hypothesis. Finally, if our hypothesis is proved to be correct, it will contribute a great deal towards obtaining better homeopathic remedies and towards standardization of their preparation. As a result, all remedies derived from a certain substance and prepared using the same kind of potentialization would have more or less fixed properties. At present, lack of standardization is the major defect of our remedies. In order to achieve standardization, the optimum force and its frequency should be established for any particular case. The necessary number of succussions for each dilution and the total number of dilutions to obtain the desired properties of the specific homeopathic remedy should also be determined.

We hope that work presented here will stimulate furtherexperimenral and theoretical research on the subject and will thus shed some light on a hot subject of alternative medicine in which the hopes of millions of people in the world are rested. This work constitutes one of the first objective scientific anempts focussed on the theoretical basis of the science of homeopathy.

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