

DEPARTMENT OF DENTAL HEALTH EDUCATION

THE HYGIENIC-PROPHYLACTIC EFFECTS OF THE EMS SALTS AND PREPARATIONS FOR THE GOV- ERNMENTAL ADMINISTRATION OF THE SPRINGS AND BATHS OF EMS*

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THE watering place, Ems-on-the-Lahn, which is known throughout the world, looks back on a long historical development as a place of healing. Owing to its magnificent situation in the valley of the Lahn, and to its alkaline muriatic carbonic acid thermae, which are the only ones existing in Germany and Austria, it has been for centuries the place of healing for the diseased mucous membranes of the air passages. By the use of its waters for internal treatment and inhalations, Ems has successfully fought and cured all kinds of catarrhal ailments, bronchitis and pneumonia. It is of particular interest to us, that Heesilius Deigelius spoke, in one of the first medical pamphlets, in the year 1627, about the healing qualities of Bad Ems, as follows: "The excellent and splendid hot springs of Ems considerably strengthen the nerves and heal bad

throats and enlarged uvula, as well as diseased gums." From this, it will be seen that already, 300 years ago, the waters of the springs of Ems were used for healing diseases of the mucous membranes of the mouth, and especially inflammation of the gums, and were particularly mentioned by such authorities as were familiar with their healing qualities.

As a matter of fact, Ems was, until the end of the tenth century, the place of healing for every kind of affection of the mucous membranes, including the most acute cases. It was only the change in theories in medicinal science, with regard to the origin and fighting of tuberculosis through light, air and nutrition, that robbed it of this class of patients. Its healing power on the mucous membranes which line the breathing tracts and the digestive tracts, beginning with the cavity of the mouth, is sufficient reason for us to concern ourselves with the influence it exercises on our special sphere, the gums, or in a wider sense, the pericementum.

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The anticatarrhal effect of the carbonic acid alkalis, through loosening the mucous membranes and liquefying the phlegm, as well as the furthering of the secretion of the glands, is well known to have a healing effect. The simple hypertrophic form of the chronic catarrh of the nose and throat, for instance, is quickly allayed by a treatment at Ems, or by flushings with solutions of the Salts of Ems. Too little attention has been paid to the fact that, simultaneously with these cures, prevalent hyperemic or inflamed membranes of the cavity of the mouth have been improved; and that diseases of the mucous membranes of the mouth, which are frequently the forerunners of diseases of the nose and throat, should be treated with the healing qualities of "Emser Salts." This is an idea which should not be lost sight of. The increasing attention which has been paid in most recent times by modern dentistry to the connection existing between pyorrhea and the loosening and ultimate loss of the teeth caused thereby seems to recommend a rational treatment of the mouth by the use of proved remedies. The healing qualities of the Springs of Ems seem to me well worth attention for this purpose. The objection that it might be questionable whether the influence could make itself felt during the short time employed in rinsing the mouth and cleaning the teeth is not valid, as it might easily be applied to any other mouth wash, and would consequently be tantamount to a complete rejection of any medicinal influence on the cavity of the mouth. Although, up to the present, the conception of treatment of the membranes of the

mouth cavity at a watering place is still foreign to us, we should give more attention to the possible influence of such a treatment in fighting the diseases of the mucous membranes of the mouth cavity. Ems is eminently adapted to curative treatment in the case of chronic pathologic conditions of the mucous membranes of the mouth, as, for decades, it has sent out into the world the healing components of its springs, "Emser Salts." The treatment of the mouth with the products of the Springs of Ems, viz., *Emser Kranchen*, and solutions gained from the "Emser Salts," is thereby made accessible to everyone, and can easily be introduced and carried out.

It may be added that the well recognized healing influence of the Springs of Ems on the membranes of the organs of speech and digestion is augmented by a specific influence of the "Emser Salts" upon the local causes of the pericementosis. During the last few years, the "Emser Salts" have experienced one, for our subject, important use, through their application in fighting the formation of tartar. It is my opinion that the work done by Rosenthal and Bergmann in Wiesbaden has not met with sufficient attention. The essentially new feature in their work is that, contrary to the usual practice in advertising dental treatments to dissolve the tartar, they intend, which seems much more convincing, to *prevent* its formation by the use of *Emsolith*.

According to her own statement, the attention of Rosenthal was drawn to the influence the "Emser Salts" have on the formation of tartar, through the

treatment of patients who came to her after having undergone a treatment at Ems. Rosenthal reports as follows one such case:

For many years, I had been treating a patient for alveolar pyorrhea, employing nearly all the usual therapeutic methods, but all without any notable success. The continual new formation of tartar in a soft state, recurring every few days, was an aggravating factor for the therapeutic treatment making itself felt. My patient, who was suffering from a chronic catarrh of the throat, went to Ems in the summer of 1919 in order to try to cure it, by taking the waters there. Shortly after finishing at Ems, she returned to me and, to my great astonishment, I noticed that there was no trace of tartar left. The fact that after a very short time there was a recurrence of the pyorrhea alveolaris, as well as a new formation of tartar, strengthened my supposition that the above mentioned favorable results were due to the action of the Ems waters. I now came to the conclusion that if a mere drinking of the waters showed such favorable results, still more favorable effects might be looked forward to by using the salts gained from the waters, i.e., *quellsalz*.

Rosenthal and Heymann have, in a number of publications, pointed out the influence of the "Emser Salts" on the formation of tartar, and I consider their theory well worth attention.

Regarding the theory of the formation of tartar, Heymann says:

The application of the modern views of Shade and Lichwitz, concerning the formation of stones in organisms in general, to the conditions we find in tartar led to the so-called colloidal theory of the formation of tartar, as it was first expounded by Rosenthal. This theory has in the meantime also been taken up by others and is in no way opposed to the views of other authorities concerning the formation of tartar; it only completes it. It only treats of the genesis, not of the etiology of the tartar; the act of separating and not the cause thereof.

In short, the essential point of this theory is that it assumes that the tartar consists of an organic colloidal basis, and the crystals which incrust it. Both are simultaneously eliminated out of a colloidal system, and by the process of shrinking turn into more or less quickly hardening stones.

Most authorities are agreed that if we apply these conditions to the processes which take place in the cavity of the mouth (which is also confirmed by the analysis of the tartar) that, to begin with, a sediment of organic substances is formed around the teeth, which then is gradually encrusted by salts of lime and hardens either more quickly or more slowly, according to conditions. Doubts can only exist as to whether this organic basis, which, in a certain sense, forms the skeleton of the stones, consists of elements of food, desquamated epithelium, bacteria, namely detritus, or whether it is a real colloidal sediment of the saliva, or fluid of the cavity of the mouth which has been increased through an inflammatory process. The truth might be found half way. An exclusively valid rule for all cases of the formation of tartar hardly exists. The varying rapidity of the formation of tartar might be apt to supply the key in this case.

We must therefore draw the conclusion that we have always to distinguish between two phrases in the formation of tartar: (a) an organic skeleton, which consists of either detritus or a detached colloid, and (b) the sediments of salts of lime on this basic skeleton.

If we follow the colloidal theory just expounded, the first basis of tartar is of an organic nature, it would seem that a way to fight the formation of tartar would be to dissolve this organic skeleton, and it is here that the efficacy of the power of the "Emser Salts" in dissolving albumin, as found by Rosenthal and Heymann, begins to assert itself.

In an introductory communication in the year 1925, Rosenthal reported the ability of solutions of the natural "Emser Salts" to dissolve albumin, as follows:

The healing power of the natural "Emser Salts" lies in the power of weak concentrated solutions of the natural "Emser Salts" to dissolve albumin. This may be easily established by a simple experiment with the aid of a test-tube. If one takes two test-tubes, each containing an equal quantity of pure blood fibrin, and adds to one 10 c.c. of pure distilled water, to the other an equal quantity of a weak solution of natural "Emser Salts," shakes them, waits a short time, and filters off the water from the sediment, the sulphurous salicylic acid in the filtrate of the solution of the natural "Emser Salts" produces a distinct sediment, while the one with the distilled water remains perfectly clear. By adding a small quantity of the natural "Emser Salts," fibrin has been caused to dissolve, while, on the other hand, in distilled water it remains indissoluble.

According to the latest reports of the chemical laboratory of Fresennis in Wiesbaden, these experiments showed quantitatively the following results:

TEST I

0.2 gm. Emser salts	
1 gm. fibrin	0.06075 gm. dissolved fibrin.
10 c.c. water	

TEST II

0.2 gm. Emser salts	
1 gm. fibrin	0.065 gm. dissolved fibrin.
10 c.c. water	

Experiments with distilled water have shown that the same does not dissolve blood fibrin.

The Ems governmental-medicinal institution for making experiments, while making the same tests, even found a solution of fibrin showing in 100 c. c. of a 2 per cent Ems salt solution 100.6 mg. fibrin dissolved.

The excellent paper published by Braunner on the formation of stones in cases of pyorrhea alveolaris, which goes to prove that the actual formation of tartar on teeth attacked by pyorrhea alveolaris is only a secondary phenomenon, which has its origin in the chronic

exudation of the place attacked by inflammation, does not appear to argue against the value of "Emser Salts" in dissolving albumin, on the formation of tartar.

Zilz and Loos speak highly of the results achieved in their practice, by the use of the Emser salts and Emsololith. The latter recommends the use of Emser salts as an addition to the now much used *Atomisens* in treating pericementosis. The lasting influence of Emser salts as a prophylactic has been made possible since the administrators of the baths and springs have, following directions given by Rosenthal, produced a tooth powder which contains a mixture of *Bolus*, with a certain percentage of Emser salts. After most thorough removal of tartar and thorough cleansing of the teeth, this tooth powder will have, on the above developed theory, the power to prevent the formation of tartar.

It is agreeable that an institution such as the administration of the Springs of Ems, which is so splendidly organized and has at its command the most modern apparatus, has turned its attention to this one subject by the production of *Emsolith*.

It might be hailed as a great advance in the whole of modern therapeutics if expert treatment of the mouth and its mucous membranes by means of washing with solutions of Emser salts (*Emser Kranchen*) and more especially the use of *Emsolith* for cleaning the teeth, were more generally resorted to.

The promising possibility of successfully improving or healing by a treatment at Ems chronic cases of diseases of the membranes of the mouth must not be overlooked.