

HOW THE FACTS ARE SUPPRESSED IN
CONNECTION WITH BONE MEAL.

By Alfred Åslander

Cohen (1963), apparently as an executive for the FDI, states that »experiments consistently failed to demonstrate caries-preventive properties in bone meal». This statement is not true. It is founded on results of experiments that have had nothing to do with the true bone-meal method as it has been worked out by the writer, *Åslander* (1948, 1958, 1960, 1963). Thus it seems called for to elucidate the problem of caries prevention by a proper tooth nutrition.

The bone-meal method as a sure caries prophylaxis is the practical application of the writer's theory of complete tooth nutrition. In

The manuscript of this article with the exception of the Appendix was sent to the editor of The Journal of the Dental Association of South Africa, Dr. L. C. Abrahams, Salt River, C. P. However, the manuscript was returned with the explanation that the article could not be printed in the journal.

The manuscript was then sent to the editor of the International Dental Journal, Professor H. H. Stones, Liverpool, because the FDI (See Appendix) appears to be at the bottom of the attack on the bone-meal method. Professor Stones replied that the executive committee of the Editorial Board had considered the manuscript but declined to publish it in the Journal.

The writer is unable to understand this attitude. At least once upon a time it was considered as an axiom that scientific investigations should aim solely at the pursuit of the truth, and consequently scientific journals should aim at publishing the truth. In this case it seems to the writer that the aim has been something else. The reader may judge for himself!

Circular from The Division of Agriculture, The Royal Institute of Technology, Stockholm 70, Sweden. No. 1, 1964.

REPRINT NO. 134A
Price - 10¢

order to be able to discuss the bone-meal method it is necessary to point out the main features of the nutritional theory. They are:

A tooth is a living tissue, not a dead mineral structure. And a tooth is an independent individual that grows out of the mandible in somewhat the same way as a plant grows out of the soil. A plant receives nutrients from the soil solution, the tooth from the blood stream. The same nutritional laws apply to both. According to well-known physiological laws, any living and growing individual needs a *complete* set of nutrients in order to attain a normal development. If one or more of the essential nutrients are lacking or present in too small quantities, then severe deficiency diseases will arise. Such deficiency diseases have been found in agricultural plants, in farm animals and in human beings. They have been studied — and prevented when the deficient nutrition has been corrected. Growing healthy teeth is very like growing healthy plants. In both cases a *complete* set of nutrients is necessary. If a tooth receives a deficient nutrition during the period of growth, then deficiency diseases are bound to appear. The structure of the teeth will be of such poor quality that it cannot stand the attacks of cariogenic agents; the structure will collapse, dental caries sets in. If, on the other hand, a tooth develops under proper nutritional conditions it will become highly resistant to or immune from dental caries. — According to this theory of complete tooth nutrition the essential tooth nutrients are, in the first place, the minerals that form the tooth structure and the agents that catalyze the formation of the structure, *Aslander* (1958).

The writer's bone-meal method was worked out on the assumption that the most conspicuous fault in our common daily fare is its deficiency in tooth-forming minerals. In order to attain a complete tooth nutrition bone meal was chosen as a food supplement, and analyses of the improved brand of bone meal used by the writer, *Aslander* (1960), have shown that it contains all the tooth nutrients that up to date have been proved to be essential. And, in addition, bone meal contains a number of minerals some of which may in the future be found to be tooth nutrients. The main rules for the bone-meal method are:

1. Tooth nutrition by bone meal should begin as soon as possible, preferably with the pregnant mother, at least during the second

half of the pregnancy and during the months of breast-feeding. The daily dose should be 2—3 grammes. (It is advisable to begin with small doses.)

2. Bone meal should be given to the child as soon as the milk is supplemented by other foods. The initial dose should be almost microscopical, but by allowing a slow increase the *daily* dose should be about 1.5—2 grammes at the age of two.

3. The *daily* dose of about 2 grammes must be given *continuously* until all the teeth are full-grown, that is, up to the age of twenty, and thereafter preferably throughout life.

4. An improved brand of bone meal must be used. So far at least, only the brand used by the writer has given perfect results.

5. Dental care must be natural. If brushing is performed, then only a very soft brush should be allowed. A hard toothbrush and tooth pastes must be avoided.

This gentle dental care is based on the theory that the dental plaque is a protective structure that should not be destroyed. The theory introduced by *Strålfors* (1950) to the effect that the dental plaque is harmful to the teeth because it harbours acid-forming bacteria must be regarded as somewhat fantastic. It is hardly likely that nature would form a harmful coating on the teeth. Far more probable is the theory that the dental plaque is a protective structure. Dental care should be gentle and aim only at removing food residues that will putrefy and thus produce foul breath.

When the rules above have been strictly observed it has been proved by more than 20 years' experience that both the deciduous teeth and the permanent teeth will be completely free from dental caries. — Thus the main feature of the bone-meal method is that it applies to *growing teeth*, not to *full-grown teeth*.

Cohen (1963) supports his criticism of the bone-meal method by the results obtained in an experiment at Falkenberg, Sweden, *Hall, Lind* and *Nyström* (1962) in which 200 school children were used as guinea-pigs. This experiment had the following features:

1. It started with children at an age of 9—12. — Thus the experiment started 9—12 years too late.

2. The experiment lasted for two school years with a summer holiday of three months between. — The duration of the experiment was negligible.

3. The daily dose of bonemeal — given in crisp bread — was only half the normal dose.

4. The bone meal used was of an unknown quality, not the brand that has given good results.

5. The degree of dental care is not reported. Probably vigorous brushing with tooth paste was recommended.

If we compare the rules for this experiment at Falkenberg, Sweden with the rules for the true bone-meal method we shall find that all the rules governing the true bone-meal method have been violated. It was claimed that the results of the experiment showed that caries activity was not affected. This result is logical. It could have been predicted before the experiment started. The bone-meal method must start before the period of tooth formation, not on full-grown teeth. If the deciduous teeth are to be saved, then tooth nutrition must start before or very soon after birth. If the permanent teeth are to grow free of caries, then one must begin at the age of two in order to ensure complete tooth nutrition.

An experiment with children has also been reported from Switzerland, *Berner et al* (1959). In this experiment children in groups of 500 were given: a) bone-meal tablets, b) fluorine tablets, and c) nothing. The experiment started with children 5—7 years of age and lasted for three years. The results were as follows: bone meal reduced dental caries frequency significantly; fluorine tablets were somewhat more protective than bone meal. The results are easily explained. In this experiment the bone meal gave better results than in the experiment at Falkenberg because it started with younger children and at a period of some active dental growth. Had the experiment started still earlier, say, at the age of 2, the *permanent teeth* of the children would probably have been caries-resistant. The action on the deciduous teeth would probably have been negligible at such a late start. — That the fluorine tablets gave a better result than the bone meal is also easily explained. We have here no (or only very little) *nutritional action* of bone meal and fluorine. We have *surface action* on more or less full-grown teeth. It is a well-known fact that fluorine, which exerts surface action on the teeth, will to some extent protect the teeth against dental caries. In the fluorine tablet the fluorine is soluble in water and is thus suitable for surface action. In bone meal the fluorine is not soluble in water, which means that

bone meal has no (or only very slight) surface activity. Bone meal contains tooth nutrients which through the digestive process and via the blood stream will reach the teeth and in *growing teeth* will build up the tooth structure from the core to the surface in such a way that the teeth will be highly resistant to or immune against dental caries. In this way bone meal gives perfect teeth, while fluorine gives only very limited protection against dental caries.

Cohen (1963) also supports his statement by some research work reported by *Ericsson* (1963). However, this paper deals only with the *surface action* on full-grown teeth by a number of minerals and thus has nothing to do with the bone-meal method that applies only to *growing teeth*. The distinction between surface action and nutritional action must not be confused.

If we compare the true bone-meal method with the experiments at Falkenberg and in Switzerland it is evident that *Cohen* (1963) and *Leatherman* (1963) support their criticism of the bone-meal method on the results obtained in experiments that have nothing to do with the true bone-meal method, which has given very good results, that is to say, 100 per cent caries-free teeth.

(At the time of proof-reading a new incident had occurred. In "Zahnärztliche Mitteilungen" No. 19/1963, page 857, there appears an article by *K. Kimmel* with the title: *Interesante Aspekte der modernen Zahnheilkunde*. In the article it is stated that the bone-meal method has failed, just as *Cohen* and *Leatherman* have stated. In order to explain the reason for that mis-statement the writer wrote a short article and sent it to the journal, but the editor, Dr. Dr. K. M. Hartlemaier, returned the manuscript with the explanation that it could not be printed in the journal. Why this dread of the truth?)

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APPENDIX

Many readers of this article will be unable to find the paragraph in the *News Letter of Federation Dentaire Internationale* attacking the bone-meal method which seems to be the foundation of the letter by Cohen (1963) in the *Journal of the Dental Association of South Africa*. The same must apply to the article by Cohen. For that reason both the paragraph and the article by Cohen are reprinted below.

»*News Letter*, No. 43, July 1963, page 2.

Bone meal as a caries preventive. The Commission on Dental Research, in response to a request from the Dental Association of South Africa, recently conducted a survey of current research into the use of bone meal for the prevention of dental caries. After studying the replies received from the Commission members and other authorities consulted, the Commission is of the opinion that there are no major investigations in this field at present time, and expert opinion does not favour repetition of experiments that have consistently failed to show caries-preventive properties for humans. (Writer's note: This paragraph seems to have been reprinted in a number of dental journals around the world. The writer would be grateful if those journals would also print a paragraph explaining the misleading conclusions drawn by the Commission.)

The Journal of the Dental Association of South Africa, September 15, 1963. Vol. 18, No. 9, page 450.

BONE MEAL IN RELATION TO CARIES

Stemming from a resolution taken at the 1962 session of Federal Council, it was decided to seek information from the Fédération Dentaire Internationale as to whether bone meal plays a part in reducing the incidence of dental caries. A letter with the above title, addressed to the Secretary of the D.A.S.A., is here reproduced. It puts the matter very clearly. The Association is grateful to the F.D.I. for the valuable assistance it has rendered. — Editor.

I have now collated the replies received by this Commission in response to your request for information on the above subject. So far as we have been able to ascertain, there is not a great deal of work being carried out in this field at the present time; this is not surprising in view of results from previous investigations which certainly do nothing to encourage belief in the value of bone meal as an anti-caries measure.

As your request was for information concerning current investigations, I shall make no attempt to provide you with lists of references to previous work on this subject. These, I presume, are available to you through the American Dental Association Index to Dental Literature and through other sources. None the less, in case you have not come across them, I am sure your Committee would be interested in a series of reports on bone meal published by the Council on Dental Therapeutics of the A.D.A. I enclose herewith a copy of one of these entitled »Bone Meal Preparations Not Acceptable to the Council«, and a photostatic copy of a later report on a commercial preparation of bone meal known as Fluorossteol.

Your Committee is no doubt aware of the functions of the Council on Therapeutics of the A.D.A., and the pains which are taken by this organization to discharge them in conformity with the strictest scientific standards. Although the reports to which I have referred were published more than fifteen years ago, the Council constantly reviews new developments and new claims, and I am assured by Dr. Sholom Pearlman, Secretary of the Council on Dental Research of the A.D.A., that no new evidence has been adduced that would call for revision of the opinions expressed in 1947 and 1948.

In fact, the findings of the A.D.A. Council on Therapeutics have recently been corroborated by the results of research carried out in Sweden, where the suggestion that bone meal could act as a caries preventive was recently revived. The renewal of interest arose from beneficial effects produced in rodents, but Ericsson of Stockholm has provided information which could explain why phosphate additives cannot be expected to achieve the same effects in humans as in rodents. This is to be published in a forthcoming Special Supplement to the Archives of Oral Biology. Ericsson has mentioned a further important point in his letter to me on this subject, viz. »Specialists on calcium phosphate metabolism and stone formation are divided as regards the possible risks for increased

stone formation from calcium phosphate additives to foods. These facts should be borne in mind when considering studies on calcium phosphates or bone meal as caries-preventive food additives.»

The most recent large scale experiment on humans is probably that carried out in the town of Falkenberg in Sweden where more than 200 school children were served crispbread enriched with 10 to 12 per cent of its weight in bone meal; a similar number of children in the population group received the same crispbread without the bone meal supplement. The results of this experiment showed that caries activity was not influenced over a period of two years. The investigation has been reported by Hall, Lind and Nyström in *Svensk Tandläkare-Tidskrift*, Vol. 55, p. 21 (1962).

Investigations in a related field are those concerned with the use of dicalcium phosphate as a dietary additive; as far as I know, the most recent of these was reported by Bibby to the Conference on Oral Biology held in Bonn last year and is, I believe, to be published in a forthcoming issue of the *Journal of Dental Research*. I am given to understand that this study has produced negative results.

I hope that the information provided in this letter will be of use to your Committee. If there are any other points that you would like to raise, I know that the members of the Commission would be glad to offer their assistance. To summarize the views that I have obtained, I would say that the Commission knows of no major investigations in progress in this field at the present time; and none of the experts I have consulted show any enthusiasm for a repetition of experiments that consistently failed to demonstrate caries-preventive properties in bone meal.

Yours sincerely,
Signed: B. Cohen.

c.c. Members of the Commission: Dr. Sholom Pearlman, Dr. G. H. Leatherman.»

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REPRINT NO. 134A
Price - 10¢

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Milwaukee, Wisconsin