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A comparative study of the stomatological stones cited in the *Kitab al-tasrif* (Albucasis, 1000 AD)

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The search for remedies to treat dental disease is as old as mankind, such is the importance of the stomatognathic system (mouth, jaws, teeth and related structures) in the evolution of man and society. The earliest records of such treatments date back to 3,000 BC according to an Egyptian hieroglyphic writing that shows Hessian-Re as head of dentists and doctors of the court. This paper will concentrate on the *Kitab al-Tasrif*, a medical treatise completed in 1000 AD by the famous Arabic physician, surgeon and pharmacologist, Abulcasis (Abu-l-Qasim al Zahrawi; 936-1013), from Cordoba (Andalusia, southern Spain). Chapter (Maqal) XXI of this thirty-chapter long, highly influential early pharmacological work, translated into Latin by Gerard of Cremona during the 12th century, is dedicated to mineral panaceas for oral and dental diseases.

Right:

'Abulcasis is helped by his assistant to remove a tumour from under the patient's tongue'.



The entries include alum, bitumen, cooked clay (phyllosilicates), arsenic, sulfur, Armenian Bole (red clay), borax, lime, verdigris (copper carbonate, copper chloride, and other copper salts), coral (calcite), lapis lazuli (lazurite), marcasite, marble, nacre, orpiment, salt (halite) and vitriol. The remedies detailed by Abulcasis are compared with those in Dioscorides' much earlier *Materia Medica* (1st century AD), the later *Hortus Sanitatis* (1496) by Johannes de Cuba, and recent pharmacopoeias. Successive authors have been influenced by their predecessors and so are their remedies.

By identifying which preparations have been retained, rejected or newly introduced it has been possible to trace and evaluate the evolutionary path of mineral-containing drugs and dental compounds, and to account for the survival of many of them in therapeutic compounds. Some of the old mineral remedies, even though they are effective, have a narrow therapeutic range and they are omitted from current pharmacology, but many of them are still useful. Thus, alum (hydrated potassium aluminium sulphate) is still often included in preparations for mouthwash and gargle, and is employed as a haemostatic and for the treatment of thrush. So is borax (sodium borate) which also has antiseptic properties and is a useful therapeutic for ulcers and throat infection. Arsenic is used for mouth chancre and as a caustic. Other salts, such as the calcium carbonate contained in marble, nacre or coral, are still used as antiseptics, tooth remineralisers and teeth whiteners.