THE HISTORY OF CALAMINE.*

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It seems that cadmia or cadmea was the precursor to our word calamine. While the origin of the word cadmia is rather vague, various authorities have given us their ideas about it. One suggestion is that it got its name from Cadmus who first taught the Greeks to use it (1). Agricola said the term was derived from calamus, meaning a reed, because of the slender stalactite form common with furnace calamine. Still another belief is that the word was derived from the Hindu calæm, which is in turn related to the Arabic term climia or calimia (2).

The belief that our modern word calamine is a corruption of the term cadmia has been quite generally accepted. It is interesting to note that as late as 1661 the term cadmia appeared in the books on medicine (3).

Recent archæological evidence seems to indicate that the Romans first used brass about the beginning of the Christian era. Pliny and Dioscorides published their works in the latter part of the first century A. D. and included monographs on cadmia. Pliny classes several products under the term cadmia. They are, zinc carbonate, zinc silicate and zinc oxide, the latter being obtained from brass furnaces. He also speaks of the use of calamine in the production of brass and states that it was used in medicine as a powerful healing and drying agent (4). The statements of Dioscorides concerning calamine are very similar to those of Pliny. Galen states that calamine from the island of Cyprus had superior therapeutic value.

For many centuries following the time of Dioscorides, Pliny and Galen information concerning calamine was very meager. However, the fact that calamine was used in the production of brass in the low countries, from about 300 A. D., remains clear.

Albertus Magnus (1206–1280) is credited with being the first to attempt to separate the zinc salts classed as calamine. He distinguished between tutia and lapis calaminaris stating that the former was an artificial product and the latter a mineral.

ZINC A NEW TERM.

There are fourteenth and fifteenth century records which indicate India and China knew about calamine and used it in the production of brass. It is said that China has an abundance of natural calamine.

The word zinc was first used by Paracelsus about 1500. During the seventeenth century zinc was found to be the metal of calamine. There seems to be some question as to who did this work. It is seemingly attributed to Wilhelm Homberg, Basil Valentine or J. H. Henckel. Marggraf and others demonstrated that calamine could be reduced to the metal and distilled in closed vessels in the absence of copper (2). In his Berlin memoirs Marggraf published one of the earliest accounts of an

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analysis of calamine. He found several samples of it to contain from $^{2}/_{16}$ to $^{9}/_{16}$ their weight of zinc.

LAPIS CALAMINARIS.

The Dispensatories and Pharmacopœias of the seventeenth and eighteenth centuries contain interesting monographs on calamine. These were very similar to those of Pliny and Dioscorides, the term cadmia being used as late as 1661 (3).

During the last quarter of the seventeenth century the term lapis calaminaris was frequently applied to the mineral. It was prepared by heating, followed by quenching with Plantone and Rose Water and finally levigating it. Calamine, at that time, was believed to be efficacious in healing ulcers and for running and rheumatic eyes.

The name lapis calaminaris was retained throughout the eighteenth century. The greatest use of the roasted mineral was that of the making of brass. However, it continued to be used in medicine. In the early part of this century Daniel Turner, a London surgeon, invented the famous Ceratum de Lapide Calaminari (5). This preparation has survived, considerably modified perhaps, for two centuries. Turner's cerate is a synonym for Unguentum Calaminæ N. F. VI. Turner believed in the merits of his preparation, and in offering it to the world he felt that he had given medicine a precious gift.

SMITHSONITE.

In 1803 James Smithson (6) analyzed four samples of calamine and for the first time distinguished chemically the difference between the silicate and carbonate of zinc. This aroused much interest as to the naming of calamine. A. Bronginart in France in 1807 gave the name calamine to the silicate. He called the carbonate zinc carbonatée. In 1832 F. S. Beudant applied the term smithsonite, in honor of James Smithson, to zinc carbonate and restricted the name calamine to zinc silicate.

In England, in 1852, Brooke and Miller proposed that these synonyms be reversed. At about the same time Kenngott proposed the term hemimorphite for the silicate of zinc. This all led to confusion in terminology. It should be stated, perhaps, that zinc carbonate is commonly called calamine or zinc spar by the British, and smithsonite by the Americans. Silicate of zinc is commonly called hemimorphite or electric calamine by the British and calamine by the Americans.

ANALYSES OF CALAMINES.

A great deal of interest was shown in the analysis of commercial calamines during the nineteenth century. The analyses of both the British and American workers from about 1837–1866 showed that the product which was sold for zinc carbonate was in reality barium sulfate colored with iron oxide. Davis (7) analyzed some English calamines and believed that the samples had improved in quality but other workers could not confirm his claims.

In view of the fact that the native calamines had been found to be so unsatisfactory there were many who favored the substitution of zinc oxide or zinc carbonate for native calamine. It seems that Fox, an English physician, was the only one who believed that a native zinc carbonate was superior to a prepared product (8).

In the years following 1880 and as late as 1910, workers continued to find that native zinc carbonate was still not being supplied for calamine, the common substitutes being barium sulfate, prepared zinc carbonate and zinc silicate.

At about the turn of the century it seems that interest in the composition of native calamines waned. The National Formulary IV (1916) admitted a prepared calamine, described as calcined native zinc carbonate or calcined zinc carbonate containing a small amount of ferric oxide. In the National Formulary V the product was zinc oxide together with a small amount of ferric oxide and silica. Prepared calamine of the National Formulary VI is described as being zinc oxide colored with ferric oxide. It should be stated, perhaps, that the color of calamine whether natural or prepared seems to have had a great deal to do with its acceptance as a medicinal agent.

To-day the native calamine is virtually unknown on the American market. On the other hand prepared calamine is well known and used as a healing and protective agent. It is popular in the form of lotions, liniments and ointments.

Inasmuch as calamine has always been a product of roasted minerals, we may say that our official product, though highly refined, is not essentially different from that used by the Romans. In view of the facts so far as we know them we favor the continuation of prepared calamine as an official product.

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BUREAU OF NARCOTICS.

(T. D. 29.)

AMENDING ARTICLE 82 OF NARCOTIC REGULATIONS NO. 5, TO EXTEND THE TIME WITHIN WHICH ORDER FORMS FOR NARCOTICS MAY BE FILLED.

Pursuant to the authority contained in Section 1 of the Act of December 17, 1914 (38 Stat. 785; U. S. Code (1934 Ed.) Title 26, Sec. 1049), as amended by Section 703 of the Revenue Act of 1926 (44 Stat. 9, 96) and Section 806 of the Revenue Act of 1936 (49 Stat. 1648, 1745), Article 82 of Narcotic Regulations No. 5, approved June 1, 1938, is hereby amended to read as follows:

"Art. 82. *Filling of Orders.*—The consignor shall enter upon the order form the number and size of the stamped packages furnished on each item and the date when each item is filled. When an order can not be filled in its entirety it may be filled in part and the balance supplied by additional shipments within 60 days from the date of the order form. A notation, covering each shipment, showing the actual quantities supplied and the date of delivery, shall be made by the vendor on the original and by the vendee on the duplicate."
