

An additional advantage that this method has is that the washings from the Gooch left in suction flask may be utilized for test for neutrality and absence from nitrates or other impurities.

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### NOTES ON ASH YIELD OF GLYCYRRHIZA.

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A series of samples of powdered Glycyrrhiza were first examined, total and acid-insoluble ash determinations being made. Following this, samples of Glycyrrhiza from different sources were prepared by submitting to various cleaning processes, then powdered and ashed.

A study of the results obtained showed that one sample, No. 3, exhibited a higher acid-insoluble ash than the total ash of clean samples. The soluble ash was also excessive for reasonably clean Glycyrrhiza. On microscopic examination, the sample proved to be largely Senna. Sulphur was not present. Apparently a pure case of accidental labeling.

The several cleaning processes used are described briefly in the table as this will enable a more ready comparison with the methods employed and the results.

| Sample No. | Source of sample and remarks.   | Percent total ash. | Percent ash insoluble in 5% HCl. |
|------------|---|--------------------|----------------------------------|
| 1.         | Commercial, No. 60 Powder.....  | 5.18               | 1.12                             |
|            |   | 5.31               | 1.15                             |
| 2.         | Commercial, No. 60 Powder.....  | 3.31               | 0.46                             |
|            |   | 3.42               | 0.92                             |
|            |   | 3.71               | 0.819                            |
|            |   | 3.45               | 0.45                             |
| 3.         | Commercial, No. 60 Powder.....  | 12.14              | 4.14                             |
|            |   | 12.08              | 4.21                             |
| 4.         | Commercial, No. 60 Powder.....  | 6.79               | 3.19                             |
|            |   | 6.78               | 3.22                             |
| 5.         | Commercial, No. 60 Powder.....  | 7.13               | 3.19                             |
|            |   | 7.17               | 3.26                             |
| 6.         | Commercial, No. 80 Powder labeled "Spanish 1918, ash 10.25".....                            | 5.09               | 1.51                             |
|            |   | 5.20               | 1.73                             |
| 7.         | Commercial, No. 80 Powder labeled "Russian 1918"  | 3.75               | 0.39                             |
|            |   | 3.77               | 0.53                             |
| 8.         | Commercial, Powdered, Spanish, 1920.....  | 3.63               | 0.47                             |
|            |   | 3.64               | 0.85                             |
| 9.         | Commercial, Whole, Spanish, garbled to remove stems, powdered, University of Minnesota..... | 4.84               | 1.25                             |
|            |   | 4.85               | 1.37                             |
| 10.        | Commercial, Whole, Spanish, garbled to remove stems, powdered, University of Minnesota..... | 4.13               | 0.77                             |
|            |   | 4.24               | 0.84                             |

| Sample No. | Source of sample and remarks.  | Percent total ash. | Percent ash insoluble in 5% HCl. |
|------------|--|--------------------|----------------------------------|
| 11.        | Commercial, Overground stems only, cleaned by brushing dry. The stems represented with dirt 12.5 percent of a 13.5 Kg. lot and were tasteless.....   | 2.66               | 0.81                             |
|            |  | 2.63               | 0.63                             |
| 12.        | Commercial, Quality A, whole, all roots brushed dry, scrubbed wet, 1-2 Cm. diameter, powdered, light and spongy.....<br>(Identified as <i>Glycyrrhiza uralensis</i> )  | 2.79               | 0.171                            |
|            |  | 2.80               | 0.22                             |
| 13.        | Commercial, Italian, rhizome and roots brushed dry, scrubbed wet, dried and powdered, No. 20.....  | 4.95               | 0.38                             |
|            |  | 5.01               | 0.45                             |
| 14.        | Commercial, Spanish, from small bundle brushed dry, scrubbed wet, dried and powdered, No. 20.....  | 3.49               | 0.20                             |
|            |  | 3.45               | 0.146                            |
| 15.        | Commercial, Quality B, small stolons, brushed dry and powdered, somewhat reddish in color, like No. 12.....<br>(Identified as <i>Glycyrrhiza uralensis</i> )   | 3.90               | 1.04                             |
|            |  | 3.84               | 0.73                             |
| 16.        | Commercial, Select No. 80 powder, 1920.....  | 5.44               | 1.26                             |
|            |  | 5.48               | 1.34                             |
| 17.        | Commercial, Powdered, bought in 1920.....  | 4.70               | 1.00                             |
|            |  | 4.69               | 0.98                             |
| 18.        | Commercial, Powdered, bought in 1920.....  | 6.06               | 1.37                             |
|            |  | 6.08               | 0.91                             |
| 19.        | Commercial, Powdered, bought in 1920.....  | 6.11               | 0.98                             |
|            |  | 6.10               | 1.39                             |
| 20.        | Commercial, Cut Licorice, powdered, No. 60 in laboratory.....  | 4.44               | 0.47                             |
|            |  | 4.44               | 0.41                             |
| 21.        | Commercial, Siftings from machine cleaning process applied to small bundle, Spanish, bought in 1920.....   | 33.67              | 18.57                            |
|            |  | 34.09              | 18.74                            |
|            |  | 32.91              | 17.81                            |
|            |  | 34.30              | 19.33                            |
| 22.        | Commercial, Small bundle Spanish, dried at 150° F. in oven 24 hours, lost 7.47 percent, shaken on No. 20 wire screen in gy-rator 12 minutes, loss of siftings 2.51 percent (see No. 21 above), powdered in laboratory..... | 3.38               | 0.37                             |
|            |  | 3.93               | 0.73                             |
|            |  | 3.92               | 0.47                             |
|            |  | 4.25               | 0.41                             |
| 23.        | Commercial, Persian, brushed dry, scrubbed wet, dried and powdered.....<br>(Identified as <i>Glycyrrhiza echinata</i> )  | 5.63               | 0.52                             |
|            |  | 5.57               | 0.36                             |
| 24.        | Commercial, Same as No. 22 but not machine or hand cleaned. Dried and powdered.....  | 4.27               | 0.87                             |
|            |  | 4.25               | 0.90                             |

| Sample No. | Source of sample and remarks.   | Percent total ash. | Percent ash insoluble in 5% HCl. |
|------------|---|--------------------|----------------------------------|
| 25.        | Commercial, Peeled Italian Licorice, bought 1921, apparently prepared from <i>Glycyrrhiza glabra</i> , powdered in this laboratory... | 4.02               | 0.67                             |

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## THE MANUFACTURE OF EFFERVESCENT SALTS.\*

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A very interesting class of the less important pharmaceutical preparations are those known as "Effervescent Salts." An Effervescent Salt, as we all know, is really a medicated ingredient in combination with an effervescent base designed to present the medicated agent in a palatable effervescing drink. The textbooks contain a good deal of information regarding salts of this character, but are deficient in certain interesting facts concerning the manufacture of these products on the larger scale.

### GENERAL NOTES.

Effervescent Salts have been very well known for the past thirty-five years. It might be said that they attained the peak of their popularity about fifteen years ago. The novelty, however, of watching the bubbles has suffered a very serious decline in the last few years, as may be noted by the fact that there are only five Effervescent Salts officially recognized in the present Pharmacopoeia. A very much larger number, however, are offered by manufacturers, and there is still considerable demand for these products. The base of this class of products is composed of practically the same ingredients, no matter what the medicinal agent, although the proportions may vary widely on account of the differences in the physical properties of the active agents used. In all cases the ingredients must be reduced to a moderately fine powder, and these are thoroughly mixed before any attempt is made at granulating. For years sugar was used in the base, not only on account of its oftentimes rendering the taste more pleasant but because sugar, when moistened or heated, makes an excellent binder for holding granules in even-size particles. It was long ago discovered, however, that sugar could not be introduced into a salt without greatly lessening its keeping qualities. There will also develop a discoloration, tapering from a pale cream color to a dark chocolate brown, even though the package remains unopened and according to the length of time the product is kept on hand. For years effervescent salts were made by the simple method of triturating the ingredients into a fine powder, mixing them, and then moistening the entire mass with alcohol. It will be noted here that strong alcohol only could be successfully employed, as the presence of water produced a very sticky mass, permitting a very generous reaction between the acid and alkali in the base, and thus rendering the ultimate product much more inert so far as effervescence was concerned, and much more slowly soluble. The moistened mass was forced through a well-tinned screen of proper mesh to produce

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