The tinctorial power of this extract is approximately three times that of a straight acetonic extract and about 300 times that of an average sample of tincture of cudbear, N. F.

As to uniformity, six samples of these extracts in a dilution of 1 to 40,000 were practically identical in tint and in intensity.

Of the six extracts just mentioned, three were prepared by making an alcoholic extract, removing the brown pigment from this by maceration with chloroform and extracting the residue with acetone; the acetonic solution being then distilled and the residue "scaled." This first step—alcoholic extraction—is, however, superfluous.

COLUMBIA UNIVERSITY, COLLEGE OF PHARMACY, AUGUST, 1912.

THE RED COLORING PRINCIPLE OF CUDBEAR.

ALEXANDER GARDNER, PH. G., BROOKLYN, N. Y.

At the 1911 meeting of the A. Ph. A. held at Boston, a preliminary paper was read and discussed by Alexander Gardner and Otto Raubenheimer in reference to Cudbear. At that time the active principle was extracted by percolating the drug with acetone and evaporating the colate to a soft extract. This process while a step forward in the right direction was afterward abandoned owing to the amount of wax extracted which made the mass undryable.

After considerable experimenting by the author, a cheap process was obtained whereby the cudbear was packed firmly in a percolator and percolated with purified petroleum ether until entirely free from wax (which requires about 2500 cc. to 1000 gm. of drug) after which the drug is subjected to desiccation.

The drug is then repacked and percolated with acetone (which will require 2500 cc. acetone for thorough exhaustion). The colate is then placed in a still and the acetone recovered, or it can be evaporated spontaneously, after which the resulting mass is placed in a porcelain capsule and heated to 210 F. for thirty minutes. The mass is then pulverized and placed in a sulphuric acid desiccator for three days during which time it will lose about 25% of its weight.

This extractive I have designated as Persionin.

Persionin is a black lustrous powder with an aromatic odor, soluble in alcohol, glycerin, chloroform, ether, and hydroalcoholic liquids, but is only sparingly soluble in water.

The following has been the yield of 5 samples of drug.

First sample	6.5% of persionin
Second sample	7 % of persionin
Third sample	6 % of persionin
Fourth sample	5 % of persionin
Fifth sample	5.5% of persionin

Each sample of persionin was tested by dissolving 1:100 in alcohol and glycer-

in 3. One cc. of this was added to 99 cc. of distilled water, in each particular the color was the same.

DISCUSSION.

Philip Asher inquired of Prof. Arny whether he had tried his tincture in acid solution, and what the effect was.

L. E. Sayre inquired as to the use of the name, "persionin." It seemed to him very unfortunate. "Persionin" would indicate that a definite principle was had here.

E. F. Cook said there was one point in regard to cudbear which he had not seen brought out by any of the investigators, and that was as to the purification of commercial cudbear by simply removing the sodium chloride, which existed in greatly varying proportions, thus causing a great deal of variation in the tinctorial power of the commercial article. If it was practical, the plan now tentatively adopted by the National Formulary, adding a definite weight of cudbear to preparations and allowing them to macerate twenty-four hours, would probably be as satisfactory as the more elaborate method now proposed.

Answering the question of Prof. Asher as to acid solution, Prof. Arny said he would like to have the experience of some of those who had been working on cudbear, as with most cudbear preparations one of the difficulties to be contended with was their behavior with acid. He was frank to say that the extract he made was precipitated by acids. In trying it out in color matching to which he had given considerable attention, he had discovered that if the menstruum was largely alcoholic it would stand acids. Another point which he had brought out in his paper was one which was generally overlooked in color-matching. In a four-ounce solution, the addition of one drop of five percent ammonia water would make a marked difference in the purple produced.

Answering Prof. Sayre, Prof. Arny said he too desired to enter a protest against Mr. Gardner's use of the word "persionin" for the substance obtained by him. He had given full credit to Mr. Gardner for his work, as could be found from his paper, but it seemed a pity that Mr. Gardner should spoil his acetone extract by giving it a name which was not correct. He (Arny) had simply given a modification of the Gardner process, and the best proof of the relative merits of the two processes lay in the fact that Mr. Gardner said he got a 6% yield of active principle from cudbear, while the yield of Arny's acetone extract was only 3%. Prof. Arny said he would be satisfied to call the product Gardner's acetone extract. Mr. Gardner's paper was too useful a contribution to the literature of this subject to quibble over a point like this, but the name persionin was nevertheless a misnomer.

Answering Prof. Cook, Prof. Arny said he had not tried percolating cudbear with water to extract the sodium chloride, but from the work he had done he was inclined to believe it was not feasible. One of the greatest reasons for the deviation in the tints of cudbear was the brown coloring matter which Mr. Beringer had described before the New Jersey Pharmaceutical Association.

His assistant, Mr. Horstmann, had planned to give a paper on the result of his chemical analyses of the three samples of cudbear which he had brought with him, the first showing thirty-one percent of ash, the second twenty-two percent, and the third only seven percent. This variation in ash content was a sufficient explanation of the variation in color tint. Next year, he said, he hoped to be able to present more fully before the Association this phase of the cudbear question.

E. F. Cook said that very often the difference in tinctorial power of the tincture was due to the fact that pharmacists did not exhaust all the cudbear. This had led him to wonder if percolation was the best way to extract this principle, or whether it was best to extract it with maceration, or by percolation with some inert substance before percolation.

Prof. Arny replied that, adopting a device that Mr. Raubenheimer had suggested, he had no difficulty in percolating cudbear by packing it, not tightly but loosely, when dry. Again referring to the paper read by Mr. Beringer, before the New Jersey Association, he said the author had recommended powdered cork for the percolation of cudbear.

Referring to the matter of cost of his several percolates of cudbear exhibited here, Prof. Arny said that the work was done in the hottest part of the year, and the cost of the first

on the basis of $2.50 an ounce for the extract was $1.22 for half an ounce, or 14 grams. The second, which chanced to be made at a cooler time, cost 55 cents for a half ounce, or $1.10 for the ounce, while the third cost $1 for half an ounce, or $2 an ounce. Inasmuch as two grains of the extract was enough to color a gallon of solution, he did not regard the cost as of much consequence. It had about 300 times the power of the ordinary cudbear.

F. W. Nitardy, referring to the question put by Mr. Cook, asked if anyone had ever tried mixing the cudbear with sand before percolating it. He had used that method in the laboratory with fairly good results.

WHAT IS ADULTERATION?

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The title of this paper presents a query that admits of many answers. It is almost like asking "What is a gentleman?" or "What is an education?" questions on which there is a wide difference of opinion, though, fortunately, some definiteness of conception. The popular idea of adulteration is that it always consists of the addition of cheaper ingredients, often harmful, to foods, beverages, drugs, confectionery, and other commodities. Very likely this was the original form of adulteration and it is often practised, but it comes very far from comprising the whole meaning of the word.

The number of causes by which an article may depart from standard quality is large and a complete list of them is difficult to give. The matter is complicated by the fact that several causes may effect a single case and there is much overlapping among them. The following are most important, the examples given being selected from a large number of possible ones, and they are not all from pharmaceutical sources.

I. Admixture with a foreign substance. This is the traditional and direct form of adulteration as exemplified by the crude notion of using sand to adulterate sugar. The dilution of milk with water is a simple and common example of this form of adulteration. It has been carried to ingenious lengths, as in the manufacture of cheese from skimmed milk which contains oleomargarine added to replace the butter fat.

II. Abstraction of valuable constituents, as the selling of spices and drugs from which important constituents have been extracted; of skimmed milk as whole milk, and many other instances.

III. Sale of an imitation for the genuine article, as colored diluted acetic acid for cider vinegar, colored diluted alcohol for whiskey, butterine for butter, acidulated solution of epsom salts for citrate of magnesia, etc. Some of these artificial products had such an illegitimate birth as this, but have become well known and now have a market of their own.

IV. Substitution, or the sale of one article under the name of another. This closely resembles the preceding but differs enough from it to be considered separately. We must confess that pharmacists have frequently been sinners in this respect. Examples are found in the sale of carbolic acid for creosote, acid phosphate of lime and other chemicals for cream of tartar, various coal-tar products for each other, and so on.