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# ALUM
# IN
# BAKING POWDER

THE COMPLETE TEXT OF THE

## "TRIAL EXAMINER'S REPORT UPON THE FACTS"

INCLUDING A REVIEW OF SCIENTIFIC TESTIMONY CONCERNING
ALUM IN BAKING POWDER AND ITS PHYSIOLOGICAL EFFECTS

AS SUBMITTED ON NOVEMBER 12, 1925
BY TRIAL EXAMINER EDWARD M. AVERILL
TO THE FEDERAL TRADE COMMISSION
WASHINGTON, D. C.

IN THE MATTER OF
ROYAL BAKING POWDER COMPANY
DOCKET NO. 540

ACCOMPANIED BY FACSIMILES OF TWO ORDERS
OF THE FEDERAL TRADE COMMISSION

PRINTED WITH SPECIAL TYPE ARRANGEMENT AND PUBLISHED WITH
ADDED FOREWORD, NOTES AND INDICES

BY

ROYAL BAKING POWDER COMPANY
NEW YORK

1927

PRINTED IN U. S. A.

*"Whenever there is doubt as to the healthfulness of an article of food, that doubt should be resolved in the interests of the general consuming public."*



From a message by Governor John J. Blaine to the Legislature of Wisconsin, on June 26, 1925, refusing his approval of a bill repealing the Wisconsin law providing that "alum in any form or shape or any aluminum salt shall be designated by the term alum" on baking powder labels.

UNITED STATES OF AMERICA
BEFORE FEDERAL TRADE COMMISSION

At a regular session of the Federal Trade Commission, held at its office in the City of Washington, D.C., on the 23rd day of March, A. D., 1926.

PRESENT:

J. F. Nugent, Chairman,
Charles W. Hunt,
Huston Thompson,
William E. Humphrey,
Vernon W. Van Fleet.

Commissioners.

IN THE MATTER OF

Royal Baking Powder Company.

Docket 840

ORDER OF DISMISSAL

This proceeding having been heard upon the amended complaint of the Commission, the answer of respondent, the testimony and other evidence, and the briefs and oral arguments of counsel,

IT IS NOW ORDERED, that this proceeding be, and it hereby is, dismissed, Commissioner Humphrey dissenting.

By the Commission.

Otis B. Johnson,
Secretary.

HOB:MP
3/18/26

# EXHIBIT A

Facsimile reproduction of the Order of the Federal Trade Commission dismissing its complaint against Royal Baking Powder Company. (See page v.)

# EXHIBIT B

Facsimile reproduction of the Supplementary Order of the Federal Trade Commission of July 7, 1926. (See page v.)

UNITED STATES OF AMERICA
BEFORE FEDERAL TRADE COMMISSION

At a regular session of the Federal Trade Commission, held at its office in the City of Washington, D.C., on the 7th day of July, A. D., 1926.

PRESENT:

J. F. Nugent, Chairman )
C. W. Hunt, )
Huston Thompson, ) Commissioners
William E. Humphrey, )
Vernon W. Van Fleet. )

| | | |
|---|---|---|
| In the Matter of | : | Docket No. 540 |
| | : | |
| | : | ORDER |
| Royal Baking Powder Company | : | |

The above-entitled proceeding coming on to be heard by the Commission upon the motion of counsel for the Commission to reopen the case and motions by counsel for respondent, and the Commission having considered the same and being advised in the premises,

IT IS ORDERED (1) that the order of dismissal issued March 23, 1926 be and the same is hereby vacated except as hereinafter mentioned;

(2) that pending motions filed by counsel for respondent be and the same are hereby denied;

(3) That the motion of counsel for the Commission to reopen the case be and the same is hereby granted as follows:

That the proceeding be and the same is hereby reopened solely for the purpose of taking testimony with respect to misleading advertising, anonymous advertising, the circulation of erroneous extracts from the book "A Collation of Cakes" by Claudia Quigley Murphy, and that no evidence be taken with respect to the statements published by the respondent Royal Baking Powder Company relative to the deleteriousness of alum baking powder, and

IT IS FURTHER ORDERED that the dismissal of the complaint with respect to the slogan "No alum - no bitter taste" be and the same is hereby confirmed, it being the opinion of the majority of the Commission that the same, as before the Commission in this case, is not an unfair method of competition.

Mr. Van Fleet refrained from voting and made the following statement for the record:

> "I refuse to vote because it is apparent that a majority of the full Commission will be in favor of the motion to reopen the case. I am still of the opinion first, that the Commission has no jurisdiction to set aside its dismissal, and second I think the procedure is irregular and that the matters presented before the Commission have been presented in an irregular way and not according to our procedure as provided by law and the rules and procedure of the Commission."

By direction of the Commission.

Otis B. Johnson,
Secretary.

# FOREWORD

**Original complaint against Royal company**

ON February 4th, 1920, at the instigation of manufacturers of baking powders containing alum, a formal complaint was issued by the Federal Trade Commission* against the Royal Baking Powder Company, charging unfair methods of competition. These included the publication by the Royal Baking Powder Company of statements informing the public that baking powders containing alum were objectionable and that its own baking powder contained no alum.

**Supplemental complaint**

On June 7th, 1923, the Commission issued a supplemental and amended complaint superseding the original, but covering substantially the same ground. The first hearing was held on November 9th, 1923, and the testimony was concluded on May 2nd, 1925.

**The testimony**

The Trial Examiner for the Federal Trade Commission, Mr. Edward M. Averill, heard the testimony in this case. He listened to 158 witnesses, including physicians, biologists, physiologists, chemists, dietitians, teachers, industrial executives, bakers, grocers, home economic experts and women's organization leaders, presenting a report summarizing the testimony and the exhibits including elaborate experiments upon animals and men. His report was filed November 12th, 1925.

**Report filed**

**Proceedings dismissed**

An order of dismissal was issued by the Commission on March 23rd, 1926, after consideration of this report and briefs and arguments by counsel. Motions

* *Created by Act of Congress, September* 26, 1914.

were at once made, however, by the Commission's legal staff to renew the proceeding, and on July 7th, 1926, a further order was made by the Commission reopening the case but limiting such reopening to the specific purpose of taking testimony regarding certain phases of the Company's advertising as defined by the modifying order.

**Proceedings reopened**

It is of interest to note that Commissioner Van Fleet who voted with the majority of the Commission in favor of the order of dismissal refrained from voting on this motion to reopen and made the following statement for the record:

**Statement by Commissioner Van Fleet**

> "I refuse to vote because it is apparent that a majority of the full Commission will be in favor of the motion to reopen the case. I am still of the opinion, first, that the Commission has no jurisdiction to set aside its dismissal, and second, I think the procedure is irregular and that the matters presented before the Commission have been presented in an irregular way and not according to our procedure as provided by law and the rules and procedure of the Commission."

It should be noted that the supplementary order of July 7th, 1926, expressly provides on the vital point relative to alum that not only "no evidence be taken with respect to the statements published by the respondent, Royal Baking Powder Company, relative to the deleteriousness of alum baking powder" but further that "the dismissal of the complaint with respect to the slogan 'No alum—no bitter taste' be and the same is hereby confirmed, it being the opinion of the majority of the Commission that the same, as

**Commission decides Royal slogan not unfair**

before the Commission in this case, is not an unfair method of competition." (See Exhibit B; Order of July 7th, 1926.) It is proper to conclude, therefore, that the Commission considers the evidence on this subject final and its order may be deemed a refusal to aid in the suppression of the facts as to the use of alum in baking powders.

**Decision final on alum issue**

The Royal Baking Powder Company now* publishes the complete text of "The Trial Examiner's Report Upon the Facts," the original order of dismissal of March 23rd, 1926, and the Commission's supplementary order of July 7th, 1926, (See Exhibits A and B), in refutation of the attacks upon its method of advertising and in answer to the charges which have been so widely circulated against it for more than six years.

The table of contents of this booklet has been arranged to furnish a connected summary of the substance of the report and the index has been made comprehensive.

The wording of the original typewritten report has been followed, including punctuation and paragraphing but certain obvious corrections have been suggested in foot notes which with the page and marginal headings are the only additions to the original text.

**Reproduction of report**

So far as possible the words of the examiner in stating facts or conclusions have been slightly emphasized by heavier type, the lighter type indicating either verbatim recitals or summaries from the stenographic minutes and exhibits comprising the official record of the evidence taken at the hearings. Follow-

**Type arrangement**

* *August*, 1926.

ing the first publication of this report, steps were taken by certain alum using manufacturers to initiate further proceedings by the Federal Trade Commission against the Royal Baking Powder Company based upon that publication. The question as to whether or not further proceedings may be prosecuted has not yet* been determined by the courts.

## THE MANIFEST PURPOSE OF THE PROCEEDINGS AGAINST THE ROYAL

**Development of use of alum**

Some fifty years ago manufacturers, in their efforts to find a cheap substitute for cream of tartar began to use burnt alum in baking powders. On account of their comparative cheapness and since they were indistinguishable in appearance from cream of tartar baking powders, the alum mixtures were sold in considerable quantities.

Shortly after their introduction, the makers of Royal Baking Powder and other cream of tartar baking powder manufacturers began to publish advertisements warning the public against the use of alum. Their statements were supported by the investigations that had been made in England on the adulteration of bread flour with alum, where it was used to conceal inferior grades of flour and to enable bakers to make a better looking bread from low grade flours than would otherwise be possible. Within a few years physiological experiments were undertaken by the most eminent scientists available at that time which confirmed prevailing opinions as to the injurious character of the aluminum compounds introduced into food through the use of baking powders containing

*June, 1927.

**Use of soda alum commenced**

alum. The makers of Royal continued to publish the results of such experiments and opinions based upon them. About 1892, when soda alum (or *sodium aluminum sulphate*, its scientific name, by which many alum using manufacturers prefer to call it) superseded the burnt ammonia and potash alums, manufacturers made no public announcement of that substitution and since then soda alum, so far as is known, has been the only aluminum compound used in baking powders.

**Attitude of Foreign Countries**

Although their sale has long been prohibited in France, England, Belgium, Germany, Switzerland and most other civilized countries, the manufacture of baking powders containing alum has rapidly increased in the United States. Before the enactment of the first pure food laws, chemical analysis was the method of determining whether or not alum was an ingredient in a baking powder. About 1900, laws were enacted in some States requiring the manufacturer to state on the label the kind of baking powder that was offered for sale and shortly thereafter in certain States manufacturers were required to state the ingredients of their baking powders.

**Manufacturer conceal alum under scientific name**

Certain manufacturers of baking powders containing alum sought a means of concealing the presence of alum. They announced that they did not use alum but an entirely different chemical, which they chose to call by its scientific name, sodium aluminum sulphate. To meet this, Wisconsin and other States required the word "alum" to be used in the ingredient clause on the label when any compound of aluminum was a constituent of the baking powder. In the meantime the Royal Baking Powder Company continued to advertise "*Royal contains no alum—leaves no bitter taste.*"

**Royal slogan**

Objecting particularly to the implication of these phrases, manufacturers of baking powders containing alum invoked the aid of the Federal Trade Commission, urging that the Royal Baking Powder Company be prohibited from making any reference whatever to the presence or absence of alum in its own product or in the products of its competitors. Further inquiry into the potential dangers to health in the use of baking powders containing alum was apparently not contemplated or expected. The manifest purpose of the proceeding against the Royal Company was the suppression of the fact that sodium aluminum sulphate is alum.

## QUESTIONS ANSWERED BY THE EXAMINER IN HIS REPORT

*Has the Royal Baking Powder Company falsely and with malice conducted a general system of defamation and misinformation concerning baking powders containing alum?*

> "There is no proof of express malice; it, therefore follows that in the absence of such proof it cannot be found that the respondent published and circulated the statements set forth in Paragraph Four supra, 'pursuant to a general plan and system of defamation and disparagement of its competitors' products and misinformation of the public,' as charged in the complaint."
>
> [SEE PAGE 38]

*What does the public understand by the word "alum"?*

> "The alum sold in drug stores is Potassium Aluminum Sulphate and Ammonium Aluminum

Sulphate and the use of these two forms of alum vary from time to time as the price of one or the other becomes cheaper" * * *

"If, on the other hand, the allegation referred to means that the public generally understands the alum sold in drug stores to be Potassium Aluminum Sulphate, then there is no proof that the public generally knows whether the alum sold in drug stores is Potassium Aluminum Sulphate, Ammonium Aluminum Sulphate or Sodium Aluminum Sulphate.

"The public only knows that the alum sold in the drug store is a whitish substance of an astringent nature which they purchase either in the crystallized or anhydrous (burnt) form."

[SEE PAGE 39]

*Is Sodium Aluminum Sulphate, Alum?*

"By the overwhelming preponderance of the evidence must be answered in the affirmative, I, therefore, find that: Sodium Aluminum Sulphate is 'alum' and is commonly so-called. To use the term 'alum' without qualification to mean SAS in connection with baking powder is not misleading. To say it is not alum may be misleading."

[SEE PAGE 44]

*Has the Respondent falsely stated that its competitors' baking powders containing alum are harmful to health?*

"The proof in this record is that the residues from alum and alum-phosphate baking powders are soluble, are absorbable and are absorbed in many instances." * * *

"It may be that, until science has advanced farther, it will not be possible to establish beyond a reasonable doubt whether aluminum compounds as used in baking powders are harmful or are harmless."

"The evidence in this record does not prove that they are harmless.

"The evidence in this record does prove that there are substantial grounds upon which to predicate an honest opinion that they are harmful."

[SEE PAGE 80]

*Do baking powders containing alum leave a bitter taste?*

"The fact is that whether there is or is not a discernable bitter taste in a biscuit made with straight alum powder depends upon the quantity of baking powder used in proportion to the amount of flour, upon whether made with milk or made with water, upon the character and quality of the shortening used, and upon the conditions of oven temperature. Carelessly made, the biscuit will leave a bitter taste, carefully made, and if eaten hot, they will not leave such a taste."

[SEE PAGE 85]

ROYAL BAKING POWDER COMPANY

*On the*
*Frontispiece will be found the*
*facsimile reproductions of*

The Order of Dismissal [Exhibit A]
Supplementary Order of July 7th, 1926 [Exhibit B]

# CONTENTS

# The Complete Text of the "Trial Examiner's Report upon the Facts."

The wording of the original typewritten report has been followed, including punctuation and paragraphing but certain obvious corrections have been suggested in foot notes which with the page and marginal headings are the only additions to the original text.

So far as possible the words of the examiner in stating facts or conclusions have been slightly emphasized by heavier type, the lighter type indicating either verbatim recitals or summaries from the stenographic minutes and exhibits comprising the official record of the evidence taken at the hearings.

R. B. P. Co.

## ABBREVIATIONS USED IN THE REPORT

*Com. Ex.* means "Commission's Exhibit" and refers to the exhibits introduced in evidence by the Special Trial Attorney for the Federal Trade Commission in support of the complaint against the Royal Company. Those exhibits are numbered serially from 1 to 273, and are part of the official record at Washington.

*Resp. Ex.* means "Respondent's Exhibit" and refers to the exhibits introduced in evidence on behalf of the Royal Company which are numbered serially from 1 to 361, and are part of the official record at Washington.

*Rec. or R.* means "Record" and refers to the official transcript of the testimony taken at the hearings comprising pages numbered from 1 to about 4,800, a part of the official record at Washington.

*SAS* means soda alum (sodium aluminum sulphate, anhydrous) a term used in the baking powder industry.

*PAS* means potash alum (potassium aluminum sulphate).

*AAS* means ammonia alum (ammonium aluminum sulphate).

R. B. P. Co.

UNITED STATES OF AMERICA
BEFORE FEDERAL TRADE COMMISSION

IN THE MATTER OF
ROYAL BAKING POWDER COMPANY } Docket No. 540

## TRIAL EXAMINER'S REPORT UPON THE FACTS*

Pursuant to an order and designation of the Federal Trade Commission, the undersigned proceeded to hear and take testimony and receive evidence in the above entitled cause.

Now, therefore, your Examiner respectfully submits to the Commission this his report upon the facts, reached upon consideration of all the testimony and evidence adduced at the said hearings.

### I.

**Royal Company engaged in interstate commerce**

The respondent, Royal Baking Powder Company, is a corporation, chartered and organized under the laws of the State of New Jersey, having its principal office and place of business at 135 William Street,† New York City, State of New York, and since the year 1900‡ has been engaged in the manufacture and sale of a baking powder, which said baking powder the respondent ships from its manufacturing plant and from its warehouses in the State of New York into and among the several States of the United States and the District of Columbia to its customers located in states other than the states in which its manufacturing plants are located, and the respondent is in direct competition with many persons, firms, partnerships and corporations engaged in the manufacture and sale of baking powder in interstate commerce.

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* *The wording of the original typewritten report has been followed, including punctuation and paragraphing but certain obvious corrections have been suggested in foot notes which with the page and marginal headings are the only additions to the original text. So far as possible the words of the examiner in stating facts or conclusions have been slightly emphasized by heavier type, the lighter type indicating either verbatim recitals or summaries from the stenographic minutes and exhibits comprising the official record of the evidence taken at the hearings.—R. B. P. Co.*

† *Now* 100 *East Forty-second Street.—R. B. P. Co.*

‡ *In present corporate form.—R. B. P. Co.*

## II.

## BRIEF HISTORY OF BAKING POWDER INDUSTRY

It is not definitely known at what time in the history of the world man, or more probably woman, first utilized a chemical mechanical agency to leaven foods made from flours. Certain it is that it antedates the time of Moses, for we have reference to the use of leavened bread in the Bible.

> "Unleavened bread shall be eaten seven days; and there shall no leavened bread be seen with thee, neither shall there be leaven seen with thee in all thy quarters." (Exodus 13:7).

**Early history of baking powder**

Prior to the year 1840, there was no baking powder sold commercially in the United States and the leavening of bread in the households and among the bakers was accomplished either by the use of yeast or the use of sour milk and soda. At a little later period, the housewife began to use, a leavening agent, cream of tartar, to which was added a given quantity of bicarbonate of soda. The first baking powder put up for sale was put up somewhat similar to the Seidlitz powder, namely, in two packages, one containing the requisite amount of cream of tartar, the other containing the required amount of bicarbonate of soda, and the housewife used from these packages in making her biscuits or other breads in which she desired the use of a leavening agent. Later it was discovered that the two agencies, namely, the acid and the alkali could be put up together and that especially could this be done if in the mixture a filler of dry starch or dry flour was used.

**First baking powders —1855**

About the year 1855, baking powder commenced to be sold on the markets of the United States. The cream of tartar baking powder was among the first sold commercially but its cost was relatively high. Others desiring to enter into the baking powder business searched for an acid ingredient which could be obtained for less money and several substitutes for cream of tartar were discovered which when first sold were sold under the name of Cream of Tartar Substitutes (C. T. S.). For many years the active acid ingredient in these Cream of Tartar Substitutes was Potash Alum, the technical name of

**Potash and ammonia alum**

which is Potassium Aluminum Sulphate; Ammonia Alum, the technical name of which is Ammonium Aluminum Sulphate was also used. Still later it was found that Calcium Acid Phosphate when properly proportioned with bicarbonate of soda would make a baking powder and this powder was also sold.

**Soda alum used in baking powders**

About 1900* soda alum, known in its dehydrated form as Sodium Aluminum Sulphate, on account of its cheapness began to be substituted for the potash and ammonia alum and later became the acid ingredient in use in all the alum baking powders.

A baking powder consists of an acid ingredient, an alkali and a filler, and the action of the acid upon the alkali in the presence of moisture gives off carbon dioxide gas, which is the leavening agent.

**Classification**

BAKING POWDERS HAVE BEEN CLASSIFIED for over fifty years by the acid ingredient used therein, the classifications being,

CREAM OF TARTAR OR TARTRATE baking powder, the same being a baking powder which has for its acid base cream of tartar and / or tartaric acid;

PHOSPHATE BAKING POWDER, which has for its active acid ingredient calcium phosphate;

ALUM BAKING POWDER, which has for its acid ingredient either potash, ammonia or soda alum;

ALUM-PHOSPHATE BAKING POWDER, which has for its acid ingredient alum (Sodium Aluminum Sulphate) and calcium phosphate.

The respondent, the Royal Baking Powder Company, uses for its acid ingredient cream of tartar and tartaric acid.†

The competitors of the Royal used Potash Alum, Ammonia Alum and, of recent years, have used Sodium Aluminum Sulphate or Sodium Aluminum Sulphate and Calcium Phosphate.

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* *Probably about* 1892.—*R. B. P. Co.*

† *And in its Dr. Price's Phosphate Baking Powder, mono-calcium phosphate.—R. B. P. Co.*

## III.

### ALLEGATION OF THE COMPLAINT

**Charges in complaint**

Specification One of Paragraph Three of the complaint charges that pursuant to a general plan and system of defamation and disparagement of competitors' products and misinformation of the public, the respondent has falsely represented, charged and asserted that several of its competitors manufacture and sell baking powders containing alum, which the general public understands to be the astringent commonly sold in drug stores and chemically known as Potassium Aluminum Sulphate (P. A. S.).

Specification Two charges that the respondent has falsely represented that the acid ingredient of the baking powder products of several of its competitors, Sodium Aluminum Sulphate (S.A.S.) is one and the same substance as alum, to wit, Potassium Aluminum Sulphate; that the general public understands Potassium Aluminum Sulphate to be the astringent commonly sold in drug stores, and that by reason of said falsely claimed alum (P.A.S.) ingredient, such competitors' powders are harmful, unhealthy, poisonous, deleterious and dangerous to users and consumers of baked stuffs made therefrom.

Specification Three charges that pursuant to a general plan and system of defamation and disparagement of competitors' products and misinformation of the public, the respondent has falsely represented, alleged and asserted,

**Specific statements charged**

(a) That competitors' powders are poisonous.

(b) That competitors' powders are made from ground-up aluminum cooking utensils.

(c) That competitors' powders do not come within the Pure Food Laws.

(d) That competitors' powders pucker up the stomach in the manner that lump alum puckers the mouth.

(e) That competitors' powders are made of the same substances that are used for styptic purposes, as shaving.

## IV.

STATEMENTS SHOWN BY THE EVIDENCE TO HAVE BEEN MADE BY THE RESPONDENT ARE CLASSIFIED AND SET OUT UNDER THE FOLLOWING HEADS,—

**1—General Newspaper and Magazine Advertising.**

**2—Cook Books and Pamphlets.**

**3—Demonstrators or Canvassers.**

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### 1—General Newspaper and Magazine Advertising.*

**Exhibits of advertising 1900-1920**

1900. Why should we use cheap, impure, unhealthful articles of food? There is no economy in them; they endanger health, they may cost life. There are reported almost daily, cases of sickness caused by eating cake, puddings or biscuit made with the cheap, alum baking powders.

In all articles for food, buy and use only the best. The good health of the family is of first consideration.

Alum is used in baking powders because it is cheap, costing less than two cents a pound. It is a corrosive poison. Think of feeding it to children! Yet the manufacturers of well-known alum powders are actually denying that they contain alum. **(Com. Ex. 1).**

1901. Safeguards the food against alum.

Alum leaves in the bread or cake Glauber Salts, Sulphuric Acid, and Hydrate of Alumina—all injurious, the last two pronounced poisonous. Alum baking powders induce dyspepsia, liver complaint and kidney trouble. Alum may not kill, but it undermines the health, and ill health makes life miserable. **(Com. Ex. 2).**

1901 or 1902. Many low-priced imitation baking powders are upon the market. These are made with alum, and care should be taken to avoid them, as alum is a poison, never to be taken in the food. **(Com. Ex. 3).**

1902. Note: Alum baking powders are low-priced, as they cost but three cents a pound to make. But alum leaves in

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** The matter under this heading, in lighter type, comprises extracts from exhibits introduced by counsel for the Commission in support of the supplemental complaint.—R. B. P. Co.*

the bread or cake Glauber Salts, Sulphuric Acid and Hydrate of Alumina—all injurious, the last two poisonous. **(Com. Ex. 4).**

1905. . . . AVOID ALUM BAKING POWDERS.

"I am very strongly of the opinion that the use of alum and salts of alumina in food should be prohibited. It is well understood that the constant use of alum compounds exerts both a deleterious effect upon the digestive organs and an irritation of the internal organs after absorption.

EDWARD S. WOOD, M.D.
Professor of Chemistry,
Harvard Medical School,
Boston."

It must be remembered that when alum baking powders are used in making bread, biscuit or cake, a portion of the alum is carried unchanged into the stomach.

Ten-cent, twenty-five-cent, cent-an-ounce powders contain alum. **(Com. Ex. 5).**

1905. . . . TURN THE CAN AROUND.

and you will learn what is the "power behind the dough." In the high-class powders it is cream of tartar, extracted from clean, delicious grapes, and that is healthful. In the low-grade powders it is "phosphate alum", or "sodium aluminum sulphate", which is also alum, a mineral acid, and that makes the food unhealthful.

Of what use are twenty-five ounces for twenty-five cents, if eight of these ounces are alum?

Food baked with alum baking powders is found to contain a portion of the alum unchanged!

The continued use of alum-made food impairs digestion, causing dyspepsia. When buying baking powder, examine the label and take only a brand whose label shows it to be free from alum. **(Com. Ex. 6).**

1905. . . . Is it economy to spoil your digestion by an alum-phosphate or other adulterated powder to save a few pennies? **(Com. Ex. 7).**

1905. . . . Baking powders made from alum, phosphates and other harsh caustic acids are lower in price, but they are injurious to the stomach.

"The injurious effect of alum on the mucous coat of the stomach is positive and beyond dispute; it is both an irritant and an astringent. The use of alum in any article of food or article used in the preparation of food should be prohibited."

JOHN C. WISE, M.D.
Medical Inspector, U. S. Navy.
**(Com. Ex. 8).**

1905. . . . Alum taken into the stomach is injurious.

Dr. Schweitzer, Professor of Chemistry, University of Missouri, says:

"Careful analyses of bread risen with alum baking powder shows a portion of the alum from the baking powder remaining in the bread as such and unaltered." **(Com. Ex. 10).**

1906. Ladies' Home Journal
McClure's Magazine.

* * *

Keep a sharp watch out for baking powders made with alum. Do not use them for raising food under any circumstances. So detrimental to health are alum baking powders considered that in most foreign countries their sale is prohibited. In many states in this country the law compels alum powders to be branded to show that they contain this dangerous acid, while in the District of Columbia, Congress has prohibited the sale of all food that contains alum.

Alum baking powders are sold to consumers at from 10 to 25 cents a pound, or a cent an ounce, and when

not branded may generally be distinguished by their price. **(Com. Ex. 11).**

. . . Guard your food against the alum baking powders. Alum baking powders are considered so injurious to health and their indiscriminate sale a source of such danger that laws have been passed in many states requiring the presence of alum to be branded upon their labels.

In the District of Columbia, under the laws of Congress, the use of alum in bread, biscuit, cake and other food is a misdemeanor.

Alum baking powders may be known by their price. Powders sold from 10 to 25 cents a pound, or 25 ounces for 25 cents, are not made of cream of tartar. **(Com. Ex. 12).**

1913. ROYAL BAKING POWDER is the greatest of modern time helps to perfect cakes and biscuit making. Makes home baking pleasant and profitable. It renders the food more digestible and guarantees it safe from alum and all adulterants. **(Com. Ex. 19).**

1913. . . . When you buy and use only the ROYAL BAKING POWDER, you have the positive assurance that your food raised by it is not polluted by alum, lime or any of the adulterants common to other powders.

* * *

It renders the food more digestible and guarantees it safe from alum and all adulterants. **(Com. Ex. 20).**

1913. . . . Mixtures made in imitation of genuine baking powders, but containing alum, are frequently distributed from door to door, or advertised and offered at a low price. Such are mixtures of unhealthful ingredients. In England, France, Germany and some sections of the United States the sale of alum baking powder is prohibited by law. Alum is a corrosive mineral acid, and physicians condemn baking powders containing it.

The label upon baking powders must show the ingredient. **(Com. Ex. 24).**

1913. . . . HOW TO DETECT THE ALUM BAKING POWDER.

"Which are the alum baking powders; how can I avoid them unless they are named?" asks a housekeeper.

Here is one way; take the can of low-priced powder in your hand and read the ingredient clause upon the back label. The law requires that if the powder contains alum that fact must be there stated. If you find one of the ingredients named alum, or sulphate of aluminum, you have found *an alum baking powder.* **(Com. Ex. 25).**

1914. NO ALUM—NO DYSPEPSIA.

* * *

ROYAL BAKING POWDER, Absolutely pure. No alum. **(Com. Ex. 28).**

1914. "NO ALUM"

must be the watchword when the housewife buys baking powder.

Alum is well known to be a powerful astringent, and should never be used in food.

*Prof. Geo. F. Barker, M. D., of the University of Pennsylvania says: "I consider the use of alum baking powder highly injurious of health."*

* * *

Royal is a Pure, Cream of Tartar BAKING POWDER. Contains No Alum. Perfectly leavens, leaves no unhealthful residues, makes the food more delicious and wholesome. **(Com. Ex. 29).**

1914. NO ALUM IN ROYAL BAKING POWDER **(Com. Ex. 30).**

Delineator . . . Besides this, the use of alum baking powders in food is discouraged by hygienists and physicians upon the ground of unwholesomeness. Such powders leave mineral salts in the food.

So, in England, France and Germany, where these matters are more closely considered, the sale of alum baking powder is prohibited. **(Com. Ex. 31).**

Scribner's

TO HOUSEKEEPERS.

The most important thing today for housekeepers is to distinguish between the pure cream of tartar baking powders and the lower grade powders made of alum. Baking powder enters into so many foods, and helps to make easily at home so many wholesome and attractive products that it is well worth while to know what are the ingredients that are entering into the family food.

Royal Baking Powder has always been made of pure cream of tartar. We import the raw material from Europe, and refine it to an excellence never before known in commerce. Thus ROYAL safeguards the food.

There are other baking powders in which alum or phosphate of lime have been substituted for cheapness. Housekeepers generally would not knowingly select such products.

The Pure Food Laws have helped to inform the public by requiring that the ingredients be printed on the label. The composition, therefore, now appears on each package, though often in small type and in an obscure place. But the information is there and can be and ought to be obtained by every user of baking powder.

Read the ingredient clause on the baking powder you are using, and buy only the kind that you believe to be the most wholesome. There is no other consideration that compares in importance with this.

ROYAL BAKING POWDER CO., NEW YORK.

**(Com. Ex. 33).**

1915. A LESSON FROM THE PAST.

Years ago, before baking powders were so well known, the housewife sometimes made her own from cream of tartar and soda.

These materials were then comparatively expensive and processes of refining had not been devised to bring them to the high state of purity of the present baking powders, such as Royal; and yet she never thought of buying alum, then as now a cheap and inferior substitute for cream of

tartar. She wouldn't think of permitting an ounce of alum to enter her kitchen.

Yet housekeepers are today asked to buy alum baking powders with which to make food for their children.

The statement on the label affixed to every can naming the ingredients of which the baking powder is composed affords a method of protection against the use of undesirable kinds.

ROYAL BAKING POWDER CO., NEW YORK.
**(Com. Ex. 37).**

Ladies' Home Journal.

What kind of Baking Powder do you use?

Some baking powders contain alum.

Alum is a mineral acid, a powerful astringent, declared by eminent medical authorities unfit to use in food. Read the back of the label on the can. It tells of what your baking powder is composed.

There is no alum in Royal Baking Powder.

If alum were considered a healthful or proper ingredient for baking powders, the Royal Baking Powder Company would use it, as its cost is exceedingly small. **(Com. Ex. 38).**

Delineator NO ALUM! SAFETY FIRST!

"Safety First" to the housewife means safeguarding the family's home-baked food against alum.

Always use Royal Baking Powder which insures delicious and healthful food.

Royal Baking Powder is made from Cream of Tartar—derived from grapes. CONTAINS NO ALUM. **(Com. Ex. 39).**

1916. ESPECIALLY *NOW*.

Watch the baking powder. Great efforts are being made to substitute an alum baking powder for the old reliable Royal. You do not want to use alum baking powders. Doctors and chemists will tell you that they add unwholesome qualities to the food. Be sure you get

ROYAL BAKING POWDER

* * *

It contains no alum or detrimental ingredients. Royal leavens the food perfectly and adds to its tastefulness and wholesomeness. **(Com. Ex. 40).**

1916. Do you read the labels to know whether baking powder is made from cream of tartar derived from grapes, or from alum or phosphate derived from mineral sources?

ROYAL BAKING POWDER. Absolutely Pure. Made from Cream of Tartar. NO ALUM. NO PHOSPHATE. **(Com. Ex. 41).**

1916. A DISTINCTIVE REASON.

What is the chief reason for the superiority of Royal Baking Powder?

There are several good reasons, but there is one which distinguishes Royal from other baking powders.

This reason, which every woman should know, is that Royal Baking Powder is made from cream of tartar, which comes from grapes. This means a healthful fruit origin. It means natural food as distinguished from mineral substitutes used in other baking powders.

There is no alum nor phosphate in Royal Baking Powder.

ROYAL BAKING POWDER CO., NEW YORK.

**(Com. Ex. 42).**

1916. DON'T BE MISLED.

Don't let demonstrators of alum baking powders mislead you with false tests and statements about the wholesomeness of their products.

Find out by carefully reading the label if the powders they offer contain alum.

And remember that alum is derived from mineral sources, and declared by many medical authorities unsafe to use in food.

To insure healthful food and the best results in baking, prudent housekeepers always use

ROYAL BAKING POWDER

which is made from pure Cream of Tartar derived from grapes, a natural, healthful food. Hence, it assures wholesome and appetizing cakes, biscuits, muffins and pastry.

ROYAL BAKING POWDER CO., NEW YORK.
**(Com. Ex. 43).**

1916. WILL YOU READ THIS TWICE?

A very important question today which every housekeeper must decide for herself is whether she prefers pure, cream of tartar baking powder like Royal, or whether she is willing to use alum baking powder in food.

One kind is easily distinguished from the other, since the laws of various states require the ingredients to be printed upon the label. If anyone is in doubt which to use, it is worth while to ask the family doctor. Then decide.

And when once a decision is reached, let no advertisement, or dealer's argument, or canvasser's solicitation, change the decision. It is not a question of a few cents or of pleasing a salesman. It is a question of health.

If this appeals to you as reasonable and sensible advice, it is worth reading twice. And it is worth remembering.

ROYAL BAKING POWDER CO., NEW YORK.
**(Com. Ex. 44).**

1916. HEALTHFULNESS IN FOOD IS MORE IMPORTANT THAN LOW PRICE

* * *

The principal ingredient of many baking powders sold at a lower price is alum or phosphate, both of mineral origin and used instead of Cream of Tartar because they are cheaper.

Housekeepers who are influenced by low price when buying baking powder will find that it pays to consider quality first.

The label on the can will show whether the baking powder you now use, or any brand, new or old, that may

be offered contains alum or phosphate instead of Cream of Tartar. **(Com. Ex. 48).**

1917. . . . The difference in cost in practical use between inferior alum and phosphate powders and Royal Baking Powder is less than a cent for each cake or pan of biscuits. Certainly too small a difference to warrant putting alum into food, and especially food for children. **(Com. Ex. 50).**

1917. HAVE YOU BEEN TRICKED INTO USING ALUM BAKING POWDER?

If demonstrators of inferior baking powders have induced you by means of false tests and statements to use their products, find out by carefully reading the label if the powders they have offered contain alum.

And remember that alum is derived from mineral sources, and declared by many medical authorities unsafe to use in food. **(Com. Ex. 54).**

1918. . . . The Government is now using Royal Baking Powder and has used it continuously for forty years.

Be on your guard against cheap baking powders as they invariably contain alum which is derived from mineral sources.

The label on the can will show whether the baking powder you now use, or any brand new or old that may be offered, contains alum.

Royal Baking Powder is made from Cream of Tartar which is derived from grapes. It contains no alum, leaves no bitter taste and is absolutely pure. **(Com. Ex. 58).**

1918. Royal Baking Powder is an absolutely pure and healthful cream of tartar baking powder. It contains no alum, leaves no bitter taste, and care should be taken to prevent the substitution of any other brand in its place. Be watchful against agents who call from house to house to sell cheap baking powders. Such baking powders contain alum as the label will show. Insist upon reading the label carefully for your protection. **(Com. Ex. 59).**

1919. IF THERE ARE CHILDREN IN THE FAMILY—you owe it to them to be sure that the baked foods they eat are made with

ROYAL BAKING POWDER

There is a very sound reason for this, even aside from quality and flavor.

There is no alum or other chemical in ROYAL BAKING POWDER to retard digestion. No mineral to injure the delicate membranes of the stomach. No bitter taste to spoil the appetite.

Royal gives you the surety of purity and is by far more economical in the end. Therefore all thoughtful mothers use

ROYAL BAKING POWDER

Absolutely Pure

Made from Cream of Tartar derived from grapes.

CONTAINS NO ALUM—LEAVES NO BITTER TASTE. **(Com. Ex. 64).**

1919. . . . BETTY SAID SHE COULD BAKE.

"I knew she never had baked a cake and I was doubtful. But I told her to go ahead.

"She got my treasured Royal Cook Book, my can of Royal Baking Powder and all the fixings—and sailed in.

"Honestly, it was the best cake we ever had, and now I believe anyone who tries can bake anything with

ROYAL BAKING POWDER

Absolutely Pure

Made from Cream of Tartar derived from grapes.
Royal contains NO ALUM—
Leaves NO BITTER TASTE. **(Com. Ex. 66).**

1919. THE TONGUE TEST.

Put a little alum on the end of your tongue and you will have the reason why alum baking powders should not be used in food.

England and France forbid the sale of baking powder containing alum.

You can tell whether baking powder contains alum by reading the label.

ROYAL BAKING POWDER

Absolutely Pure

ROYAL CONTAINS NO ALUM—LEAVES NO BITTER TASTE. **(Com. Ex. 68).**

1919. . . . Prudent mothers avoid cheap baking powders because they frequently contain alum. No matter how much they are urged to change, they stick to

ROYAL BAKING POWDER

They know it is absolutely pure.

ROYAL CONTAINS NO ALUM—LEAVES NO BITTER TASTE. **(Com. Ex. 69).**

1919. "YES, I TRIED IT, BUT I WENT BACK TO ROYAL."

This is the experience of most women who have been tempted to try so-called cheaper baking powders which, almost always contain alum and often leave a bitter taste.

ROYAL BAKING POWDER

Absolutely Pure

Made from Cream of Tartar derived from grapes.

ROYAL CONTAINS NO ALUM—LEAVES NO BITTER TASTE. **(Com. Ex. 70).**

1919. . . . Some women, however, do not know that food made with cheaper baking powders, containing alum and phosphate compounds, is often inferior in taste and texture;—many of the highest food authorities have declared alum baking powders to be unwholesome and injurious. **(Com. Ex. 71).**

1919. HER BITTER EXPERIENCE.

She could not imagine what was the matter with her baking.

Her pans were always perfectly clean. She used a famous brand of flour, good butter, fresh eggs—and yet her baking had a bitter taste.

Finally her husband asked what kind of baking powder she used. When she told him what she was trying, he said:

"There is the whole trouble. If you read the label you will find it contains alum, and that's what leaves the peculiar taste."

Now she has gone back to ROYAL BAKING POWDER and her bitter experience is forgotten.

* * *

Made from Cream of Tartar derived from grapes.

CONTAINS NO ALUM—LEAVES NO BITTER TASTE. **(Com. Ex. 74).**

1919. ROYAL BAKING POWDER
is absolutely pure.

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It contains no alum—leaves no bitter taste.

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Alum in food has been condemned by many medical authorities—England and France forbid it. **(Com. Ex. 78).**

1920. BITTER OR BETTER BAKING

A letter makes a great difference in a word. A word makes a great difference in baking powders.

If the little word "alum" appears on the label it may mean *bitter* baking.

If the word ROYAL stands out bold and strong, it surely means BETTER baking.

This is only one reason why it pays to use ROYAL BAKING POWDER. **(Com. Ex. 109).**

1920. WHY MAKE A SECRET OF "ALUM"?

If alum makes safe baking powder why don't they advertise the virtue of alum? If alum is something to be proud of why conceal it on the label in type as small as the law permits? If alum is something to be ashamed of there must be a good reason to avoid it.

ROYAL BAKING POWDER

is proud to proclaim that it is made of Cream of Tartar derived from grapes. ROYAL CONTAINS NO ALUM —LEAVES NO BITTER TASTE. **(Com. Ex. 137).**

**2—Statements made in Cook Books and Pamphlets.***

**Commission's Exhibit 236 is a cook book issued by the Royal Baking Powder Company, copyrighted, 1911. This book is largely given up to recipes, but on the inside cover or in the center of the book, occur the following statements:**

**Statements in Royal cook book-1911**

Look out for alum baking powders. Do not permit them to come into your house under any consideration. They add an injurious substance to your food, destroying in parts its digestibility. Physicians will tell you this, and it is unquestionable. The use of alum in whiskey is absolutely prohibited; why not equally protect the food of our women and children?

* * *

No alum, ammonia, phosphates, or unwholesome or doubtful substances are used in Royal, while the superior purity and fineness of its ingredients are shown by the fact that it costs more to manufacture than any other brand.

* * *

There are numerous brands of these low-grade powders, mostly made from burnt alum and lime phosphates. They can be distinguished by some dealers because they are bought cheap (they cost less than three cents a pound to make) and yield a huge profit. **(Com. Ex. 236).**

** The matter under this heading, in lighter type, comprises extracts from exhibits introduced by counsel for the Commission in support of the supplemental complaint.—R. B. P. Co.*

**Commission's Exhibit 234 is a pamphlet entitled "Why Westfield objects to Alum in Food Products." A re-print from the Hartford, Connecticut, Times of February 25, 1915, an article which reflects the views of the Pure Food Town of Westfield, Mass. This pamphlet was distributed by the respondent through its canvassers and placed in the hands of householders in connection with the Royal cook books.**

## WHY WESTFIELD OBJECTS TO ALUM IN FOOD PRODUCTS

**Westfield pamphlet**

The famous Westfield Standard was created by Prof. Lewis B. Allyn, member of the Board of Health and Town Chemist of Westfield, Mass. (Reprinted from the Hartford, Conn., Times of February 25, 1915).

That alum is not a fit ingredient of human food seems undebatable. No less authority than Parke, Davis & Company, one of the largest drug firms in the country, in their manual of Therapeutics have this to say concerning alum:

> "Powerful astringent (causes living animal tissue to contract). Rarely used internally, except in painter's colic."

This substance finds its greatest use as a food adulterant in low grade baking powders, pickles, condiments, etc. It is employed in cheap baking powders to furnish a low cost acid to act on the baking soda, and in pickles and condiments to impart a false appearance of freshness and crispness.

Alum undisputably is of value in relieving painter's colic, but it has no place in foods for human consumption.

Strychnine, for instance, is a tonic in certain cases, but it is not for that reason to be recommended for general use. Physicians may prescribe alum if they choose, but the food manufacturer has no right to dose both sick and well alike.

It should be understood that all of the alum put into a cheap baking powder does not go into the system as alum. It splits with the soda into several compounds: Aluminum hydroxid, sodium sulphate, commonly known as "Glauber's Salts," potassium sulphate and carbon dioxid. This latter is the leavening gas.

"Stop your attacks on alum," says the spokesman of the food adulterators. "You are threatening our great industry."

Most manufacturers of food products who are using alum state the presence of this objectionable drug on the label. You will never find this statement in large type prominently displayed, but in small type on the back of the label, and the only reason it is here at all is because the government demands it.

The man who uses alum in a food product does not proudly boast of it in his advertising. The fact that alum is present is not a thing to boast of—and he knows it.

If alum is a chemical that should be added to food, why not be honest and say so in large type?

To quote one of the most efficient and conscientious of public health officials:

"Alum is recognized as and conceded to be a poisonous substance capable of producing serious and even fatal results when taken into the system. Hence its use in foods for man has been expressly prohibited by many of the governments of Europe, including Great Britain, France, Germany, Italy, Belgium, Roumania and several of the Swiss cantons."

Westfield objects to the use of alum in all food products whether baking powder, pickles or condiments, for the following reasons:

"This poisonous, irritating, astringent drug is either directly injurious or it may split up into objectionable compounds.

"No salt of aluminum is a food product in itself.

"It is not a natural constituent of the human body.

"So far as is known, no public health official of standing endorses alum as a food ingredient."

Westfield, the Pure Food Town, believes, in the presence of such a mass of direct evidence concerning the objectionable qualities of the drug, that alum treated foods should be entirely avoided.

Alum belongs in the front rank of such objectionable chemicals as benzoate of soda, boric acid, salicylic acid, sulphuric acid and formaldehyde.

Look for the small type on the label.

HERE IS THE FOOD STANDARD OF THE PURE FOOD TOWN OF WESTFIELD, MASS.

More exacting than Government Food Standards or State Food laws:

"Foods shall not contain added ALUM, COPPER, FORMALDEHYDE, SULFUROUS ACID or its Salts, BORIC ACID or its Salts, BENZOIC ACID or its Salts, FORMIC ACID or its Salts, HYDROFLUORIC ACID or its Salts, SALICYLIC ACID or its Salts, nor any other noncondimental preservative.

"Foods shall not be colored with COAL TAR DYES, nor with poisonous VEGETABLE COLORS, nor be contaminated with inert fillers, nor shall any substance be taken therefrom or added thereto so as to injuriously affect their quality, strength or purity.

"Foods shall be packed and sold under sanitary conditions and package goods shall bear no DISHONEST LABEL nor labels bearing any EXTRAVAGANT or OBSCURE statements."

For protection to yourself and your family, see that you buy only foods and beverages that are certified under "The Westfield Standard."

You will then be buying only products of high food value —wholesome and pure. **(Com. Ex. 234).**

**Royal cook book—1920**

**Commission's Exhibit 235 is a Royal Cook Book copyrighted in 1920 and widely distributed. There are no references to alum in this book except the statement "CONTAINS NO ALUM—LEAVES NO BITTER TASTE."**

**The Royal also used a form letter which they from time to time used in circularizing any particular section of the country where they were conducting a campaign. This letter was used from about 1921 up to the present time and is in evidence as Commission's Exhibit 238.**

Dear Madam:

**Royal circular letter**

As traveling agents sometimes call from house to house for the purpose of urging housekeepers to substitute inferior baking powders for Royal, we take the liberty of writing you a word of caution.

These cheaper baking powders are offered under the guise of economy but usually they contain alum, a mineral acid which is not in itself wholesome.

One cannot be too careful about the ingredients used in the preparation of food, as the health of the family, and especially the children, is vitally concerned. Therefore the *kind* of baking powder used should have the most careful consideration.

Housekeepers who realize the importance of healthfulness in baking use Royal Baking Powder. In common with domestic science and baking experts who have preferred and recommended Royal for more than fifty years they know its superior qualities and will not accept a substitute.

Royal Baking Powder has as its chief ingredient cream of tartar, which is derived from grapes. This means a healthful fruit origin. It means food finer in texture and flavor than any substitute can produce and what is of even greater importance, insures its healthfulness.

Remember this and whenever you are asked to substitute another baking powder ask yourself this question, "Do I prefer a pure, cream of tartar baking powder like Royal or am I willing to take chances with a baking powder which contains a mineral acid ingredient which is not in itself wholesome?"

Respectfully yours,

ROYAL BAKING POWDER COMPANY.

P. S. Some baking powders contain a sticky substance added to make them foam high in a glass of water. This so-called "test" frequently misleads people into believing that such baking powders are stronger or better than others. But such is not the case. Almost any baking powder will foam in the same way if you add some mucilage to it. Be on your guard against the tricks of traveling agents. **(Com. Ex. 238).**

**Commission's Exhibit 241 is a pamphlet gotten out by the Royal, entitled "Baking Powders, Classification and Ingredients" and divides baking powder into three principal classes, according to the reacting ingredients.**

1. Tartrate.
2. Phosphate.
3. Alum (or alum phosphate).

**and after describing the tartrate and the phosphate powder, describes the alum powder as follows:**

(3) ALUM
(or Alum-Phosphate)

**Royal circular**

Alum baking powders contain Alum, Bicarbonate of Soda and Cornstarch; Alum-Phosphate baking powders contain Alum, Phosphate, Bicarbonate of Soda and Cornstarch. In most of the so-called Alum-Phosphate baking powders the quantity of Alum used is much greater than Phosphate.

In a few brands of baking powder, a very minute quantity of Albumen (white of egg) is added.

See "Albumen".

The alum used in baking powders is sometimes designated as "Sodium Aluminum Sulphate" or "Sodic Aluminic Sulphate" and is derived from bauxite, a mineral substance containing a large percentage of aluminum. The elements of which Alum is composed are sodium, aluminum, sulphur and oxygen. Of these aluminum is not a normal constituent of the human body, and many eminent scientists believe that Alum should not be permitted in the preparation of food. **(Com. Ex. 241).**

**Commission's Exhibit 248.**

**In Duncan's Trade Register for November, 1923, published in Portland, Oregon, and which has considerable circulation on the Pacific Coast, and in the mountain section among grocerymen, the following language is used in an advertisement:**

**Royal advertisement —1923**

". . . Count the staples that you can absolutely depend on to repeat—

See if the first one you think of is not
ROYAL BAKING POWDER."

This being true, why jeopardize your good will and profit by selling baking powder charged with cheap alum?

Commission's Exhibit 249.

**"A Collation of Cakes"**

A booklet entitled "A Collation of Cakes," by Claudia Quigley Murphy, printed in 1923, a book intended to be used in the classroom for the teaching of culinary art as well as in home demonstration work, women's clubs, etc. This book is the work of Claudia Quigley Murphy, gotten out by her and offered to the Royal Baking Powder Company, who paid her for her services and who assisted in the distribution of the book.

On pages 20, 21, 22, 23, 24, 25, 26 and 27 the author under the heading, "What chemistry has contributed to cake making," quotes from many authors, giving in each instance the author from whom she is quoting and the work from which the quotation is taken, among them appearing the following statements:

"The Chemistry of Cooking and Cleaning," published Boston, 1882:

"The various products formed by the chemical decomposition of alum and soda are possibly the most injurious, as the sulphates are supposed to be the least readily absorbed salts." (Prof. Richards, Boston).

* * *

**Quotations from "A Collation of Cakes"**

"A few of them, however, contained alum, and these leave some alumina, or, more probably, hydrated oxide of aluminum, in the bread." (Dr. Robt. Hutchison, London, 1911).

* * *

"The various products formed by the chemical decomposition of the alum and 'soda' are possibly the most injurious, as are these sulphates, and are thought to be the least readily absorbed of salts. The sale of 'alum' baking powder is prohibited in many states." (Margaret E. Dodd, S.B., Chicago, 1910).*

"Cheaper acids have sometimes been used, especially alum. It is best not to use an alum powder." (Helen Kinne, Columbia University, 1914).

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* *Publication date was* 1907.—*R. B. P. Co.*

"Baking powder may be grouped in three classes:

1. Cream of Tartar Baking Powder.
2. Phosphate Baking Powder.
3. Alum Baking Powder.

Describes 1 and 2. Of 3, says, "Alum powder is made from potash alum or ammonium alum, soda and starch, and its sale is prohibited in some states because of the harmful effects of alum on the human system, though the alum is decomposed when soda is added." (Emma Conley, Wisconsin).

* * *

"Alum baking powders contain sulphuric acid in alkali sulphates. These are considered harmful by physiological scientists. They hinder digestion by acting as an astringent, as does the substance commonly known as alum. Alum touched to the tongue puckers the mouth. Alum baking powder residue taken in food acts similarly upon the digestive tract. (Edith Greer, Boston, Mass., 1915).

* * *

ALUM BAKING POWDERS

"These are the most objectionable forms of baking powders, as their residue has an irritating effect upon the mucous membranes of the digestive organs. They are very cheap powders, so, unfortunately, they are extensively used." (Matilda Campbell, Ohio, 1914).

**3—Statements made by Demonstrators or Canvassers.**

**Conflict between rival companies**

**Calumet canvassing crews**

**The background behind the statements of demonstrators must be carefully considered before any proper evaluation can be put upon them. The strife between the rival baking powder companies had been long and very bitter; especially is this true of the conflict for supremacy between the Royal and the Calumet. As early as 1909 the Calumet had adopted a policy using demonstrators or canvassers in the furtherance of its sales. These demonstrators consisted of crews of from ten to twenty women under the direct control of a Crew Manager who were sent into a defined territory to make a house to**

house canvass, not selling but advertising the Calumet powders, recommending by word of mouth and demonstrating by two tests to the householders the alleged superiority of the Calumet powder. These girls were required to make a given number of visits and tests each day; were given written instructions as to the language to be used, definite instructions as to the manner of making the tests and were trained and made letter perfect before being sent out. The Crew Manager followed them up and by visits at the houses where the girls had called ascertained how the instructions had been carried out and whether the tests had been made and, wherever possible, the effect upon the housewife of the talks and demonstrations. These demonstrators were equipped with a Sterno stove, with which to make a comparative cooking test between the Calumet powder and the powders of its competitors, particularly Royal powder. They also had glasses in which to make a comparative cold water test. They distributed Calumet literature and especially Calumet cook books. In these cook books appeared the following language in respect to Royal: (Calumet Cook Book issued in 1909 Resp. Ex. 179).

**Statements in Calumet Cook Books**

"CREAM OF TARTAR DRUGS ALL FOOD"

"Cream of Tartar, when used in baking, always forms Rochelle Salts which is the chief ingredient of a Seidlitz Powder.

"That fact can not be truthfully denied. Every physician and chemist knows it to be indisputable. Here is what Dr. E. H. Bartley, Chief Chemist of the Brooklyn, N. Y., Board of Health, and one of the leading physicians of that city says about cream of tartar baking powders:

'Whenever Cream of Tartar is used in the kitchen it is changed chemically and becomes Rochelle Salts. The Cream of Tartar which forms the chief ingredient of so many baking powders is, in the opinion of all who have given the subject proper attention, always injurious to health. Bread made with Cream of Tartar and Saleratus, is far inferior to that made with other preparations.

'Rochelle Salts are a cathartic, a medicine which so irritates the stomach and intestines that nature sets up an inflammation and a sickness to expel it from the system. This expulsion takes the form of cramps, diarrhea and dysentery. Probably this is the reason many cannot eat hot biscuits without distress.

'Besides this, the salt produces indigestion, dyspepsia and constipation. Whenever there is a tendency to kidney disorders, it aggravates them and in many instances aids in starting the latent disease.

'Calumet Baking Powder leaves nothing injurious in the food.' "

* * *

"DR. A. WARNER SHEPARD, FORMER HEALTH OFFICER IN BROOKLYN, said:

"I have not the slightest doubt that the mental and physical health of thousands is permanently injured by the excessive use of Rochelle Salts in impure beer, bread and other forms of food and drink. It certainly is a factor in the alarming increase of Bright's disease of the kidneys, and similar complaints. It irritates the stomach, bowels and kidneys, and may therefore produce the most unfortunate results."

Calumet Cook Book for the years 1911 and 1914 also carry the extracts above.

**Calumet use of egg albumen**

Now Calumet is an alum-phosphate powder. To this powder the Calumet add a small quantity of egg albumen (dried white of egg) which add no leavening power to the powder but when water is added to the powder in a glass, form a coat or film on the surface of the mixture and harnesses or holds the carbon dioxid gas preventing its premature escape.

**Efforts to counteract water glass test**

Royal is a tartrate powder, contains no white of egg and therefore will not hold the gas when subjected to a water glass test. Both of these tests were by their competitors considered deceptive and misleading, and to meet and counter-

**—canvassing crews**

act the effect of the Demonstrators' work, the Royal in 1913 put out crews of demonstrators who were likewise carefully trained, given carefully prepared written and printed instructions and made letter perfect before being put to work. Then they were turned loose to go to work and undo wherever possible, the harmful results of five years of steady work by the Calumet. Thus it frequently came about that crews of Calumet and crews of Royal demonstrators met in the same city, town or rural district or one immediately preceded or succeeded the other.

The devisors of the carefully worded and phrased instructions "had not stood to the Auroch when the red sands reeked of the fight," and either did not care or overlooked the fact that "men (women even more so) have no time at the hocking to count its curls aright."

Armed with spicy literature abounding in half-baked expressions from some supposed scientist, with Sterno stoves and deceptive water glass tests, these hostile bands of women entered eagerly and wholeheartedly into the combat.

"Ever so the she bear fights
Speech that drips, corrodes and poisons
Even so the cobra bites."

This is the background; the following are the statements:

**Statements by canvassers**

In November, 1922,

"Well, of course, Royal is made from fruit acid ingredient whereas Calumet and practically all the other powders are made from mineral ingredients that come out of the ground. The ingredients that they are using are called alum." **(Rec. 122).**

"Do you mean to tell me that they put in this baking powder the same stuff that I put on my face after shaving?" To this question the demonstrator replied: "Yes, it is exactly the same thing. See these pans and things up here (pointing to cooking utensils)? They are made from the same substance, the same alum acid." **(Rec. 123).**

"Alum is not good for you because it causes stomach trouble." **(Rec. 124).**

"She showed me alum and told me that was what was used in Davis; that it was ground up aluminum, the same stuff that I had for my pots and pans for my kitchen." **(Rec. 131).**

"She also said that the man who started this will have to pay the penalty on his deathbed, when he dies for deceiving the public for putting his ground-up aluminum in his baking powder. The alum that was in the baking powder was the common alum that we used for medicinal purposes." **(Rec. 133).**

**Mrs. Edwin Anderson, housekeeper in Springfield, Ohio, testified concerning an interview with Royal demonstrator in 1921.**

Demonstrator was from the Royal Baking Powder Co. She asked what kind I used and I said Calumet. She said, "Do you know that it is injurious to your stomach?" I said, "We have used it quite a while and it has not hurt us yet." She said, "It contains alum and phosphates that are injurious to your stomach."

I use alum when the children have sore throats or sore mouths and the men use it when they shave. I have six children and I have used it for sore throats and I didn't think it was injurious. My husband is a plasterer. **(Rec. 231-232).**

**Mrs. Ida Bircher, housekeeper, Springfield, Ohio.**

Had a call from the canvasser of the Royal Baking Powder Company about two years ago (1922). She said there was alum in the baking powder. It was a cheap baking powder. She was speaking of the Calumet and Davis. Said it would give us stomach trouble. I said I had stomach trouble and have been having it and maybe that was what did it. She said the baking powder I was using was cheap baking powder and that there was alum in it.

I understood when she said alum that she meant this powderized burnt alum which is used sometimes for sore throats and things like that. I sometimes use it to clear things and I

use lump alum then. I get it at the drug store. I thought she meant the alum which I buy at the drug store. I did not get the Royal and am using Calumet still.

Q. If this party who demonstrated the Royal had told you that the Davis Baking Powder contains Sodium Aluminum Sulphate, what would you think it had in it?

A. I could not have told. I would have thought it was awful danger I presume. She called off some big words I could not understand and she talked awful fast. Husband is night watchman. **(Rec. 239).**

**Mrs. C. E. Allen, housewife, Springfield, Ohio.**

Used Calumet Baking Powder. Used it for about three years. Had a call from a Royal canvasser somewhere near a year ago. She said the Calumet Baking Powder hurts your stomach because there is alum in it. I did not say anything only that the Calumet suited me just fine. When she said there was alum in the Calumet I did not know what effect it has on the stomach. I know what it is. We buy it in the drug store. I never use any of it myself.

I know that alum is injurious to people. I read it and heard people say. This is all I know. My husband is a moulder. **(R. 245-247).**

**Mrs. Emma Rittenhouse, housekeeper, Springfield, Ohio.**

I always used Kenton Baking Powder until the Calumet came along. I am using Calumet now. Had a call from a canvasser of the Royal about two years ago this fall. She said that Royal was the best baking powder because it contained no alum or phosphate and the Calumet did. I did not bring in my baking powder for her to look at. She did not ask for it. She said there was alum and phosphate in the Calumet. She said it was not healthy. I do not understand what alum contains nor the effect it has on the stomach. I should not think it would have a very good effect. I have used a little alum. You buy it at the drug store either in lump or powder. I use it for a wash. I one time put a little alum in some bread but I do not use it often; that was before there was much

baking powder on sale. When the demonstrator said there was alum in Calumet I understood she meant the same substance which I had been using. **(R. 251-255).**

**Mrs. H. A. Bernart, housewife, Cincinnati, Ohio.**

Canvasser of Royal called on her a little over two years ago. She took some of the Davis and said it had alum in it. I don't know just what she said, but it was injurious to the stomach. She said the Davis powder had alum in it. I don't know what alum is, but I have it in the house. I use it for sore mouth that is all. It is in lump. I buy it in the drug store.

Q. When the canvasser said there was alum in this powder, did you think she meant the same stuff you had in the house?

A. Oh, really, I didn't think anything of this. She came just at supper time and I didn't really pay much attention because I have been using Davis, and Davis never hurt me so, of course, I didn't think anything about it. I have also used Royal, but I had more luck with Davis than with Royal. Yes, I still use Davis. I use Royal, too. **(R. 267-271).**

**Mrs. Robert Blake, housewife, Washington Courthouse, Ohio.**

Royal canvasser called about a year ago. She demonstrated but I don't know what she did. She ran the other powders down but I could not tell you what she said. I do not remember what she said about alum. I don't know that I understand alum. I know it's alum. That's all I know. Always saw it in lump and get it at the drug store. I have had it in the house. **(R. 307).**

**Carrie I. Whitney, stenographer, East St. Louis, Mo. Formerly in employ of rival Alum Baking Powder Company. Details interview with canvasser for Royal on February 19, 1921.**

This particular demonstrator was introducing Dr. Price's Baking Powder. She asked me if she could interest me in Dr

Price's Baking Powder. I replied that I had been using Calumet. She said that Calumet is a good baking powder, but it is an alum baking powder and any baking powder that contains alum is harmful to the stomach. Then she went on to tell me about a brother-in-law of hers who was a druggist, and who said that alum was always harmful to the stomach, and she said: "You know when a man shaves and cuts his face, he uses alum," and she told me about some man who was in the store and told her that he had a child who was sick for a long time, and he finally took it to the doctor; that the mother of the child had always been very careful to give the child pure foods, and baked fresh cookies for it every day, and gave it a lot of baking powder biscuits, and corn bread and the doctor on examination told her that the child had been given too much food with alum in it.

The demonstrator said: "You know that alum would shrink the nerves of the stomach." This demonstrator also was giving away a pamphlet entitled "What Dr. Wiley said about Alum* in Baking Powder." **(R. 345-352).**

**Frances Ruth Ramsey, Warrenburg, Mo., was at one time employed as a demonstrator for Royal in the year 1921, for six or seven months. We started in Kansas City, also worked Topeka.**

When calling on housewife would ask her what kind of baking powder she was using, and asked if I could see the can of the baking powder, and in my talk I called her attention to the fact that she was using alum powder; told her that she would not wish to use alum powder; told her that alum was poisonous; that it was an astringent that would contract the muscles and was given only in severe cases like painter's colic, or to say some of the large animals, such as elephants, because the contracted muscles would leave bad results; and call her attention strictly to the alum, and generally they would become quite interested, and I have had them to walk right out and throw out their baking powder after my test. Could get them to do that right often. I have had them throw out Calumet, Davis and Rumford. **(R. 400-403).**

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* *Should read "albumen."—R. B. P. Co.*

**Miss Winifred Curtis, St. Louis, Mo. In the candy business. Formerly demonstrator for Calumet.**

In February, 1921, in East St. Louis, heard a demonstrator of Royal. Demonstrator asked her what baking powder she was using. I said "Calumet." Demonstrator says "You know that has alum in it. Anything that contains alum is injurious to the stomach." She said that the barber used alum on cuts to dry up the blood, and she told about the woman who had a child with an ulcerated stomach, and the doctor claimed that it was from baking powders she had been using. **(R. 442-444).**

**Florence Schisler of Chicago heard a demonstrator of Dr. Price's Baking Powder in a department store.** "I asked for a can of Calumet and she said when anyone inquired for Dr. Price's or Royal or Rumford I am always glad to sell it, as I find it contains a phosphate that physicians prescribe for patients, where Calumet contains alum and it is injurious to the lining of the stomach." We had quite an argument, and I asked her about that test and she said the test was defrauding because anyone could make a test, but that did not prove anything, that it did not prove that Calumet was any better than any other, in fact that Calumet was inferior on account of the aluminum it contained. That was in January, 1922. "I had worked for the Calumet and had done quite a bit of baking and I found Calumet to be best, because my mother used Royal and I used that a number of times, and I have always had great success with Calumet, and I find it more of a saving to use Calumet." **(R. 533).**

**C. Gertrude Kessling, Springfield, Illinois. Housekeeper. Listened to demonstration of Dr. Price's Baking Powder.** Was employed by Mr. Dunn who was connected with Calumet Baking Powder Company to visit stores where Royal demonstrators were at work to converse with them and ascertain what they had to say about baking powders.

The demonstrations were taking place in stores. Demonstrator asked me if I ever used Price's Baking Powder and I said I had and that I liked it, but I had been using other powders and had used Calumet for the last several years.

She said her mother had always used Dr. Price's Cream Baking Powder, and she used it because it contained no alum, and she said there were other baking powders and named a few of them, that did not contain alum, which she thought were as good as Price's. I asked her what she thought of Calumet and she said it contained alum in quite a large quantity. Then I asked her what were the injurious effects about it. I said I knew it had a little alum, but I never thought of it as being injurious, and she said it was, that it had great leavening qualities and that was something that was injurious to the stomach.

This demonstration was in February, 1921. On the same day in another store, the demonstrator asked if I had ever used Dr. Price's Baking Powder and I told her I did, but lately I had not been using it, and she said she would like to have me try it because it contained pure phosphate soda and it contained no alum, and nothing that was a leavener that would injure the stomach, and I asked her what injurious qualities were in alum. She said it was an astringent and was very injurious to the stomach. She told me that on the can of the Calumet it made a statement that they used alum powder, and I told her I knew there was some alum in Calumet Baking Powder, but I did not know that it was injurious to the stomach; that my understanding was that after the food had been cooked that that quality was taken out of it by the heat of the oven. She did not make any reply to this question.

I made some eight or ten calls that day and met practically the same statements everywhere I went. One demonstrator told me—I don't know how to express it—that it drew the lining of the stomach, gnawing qualities, and was injurious in that way. These instances occurred in Springfield, February 25 or 26, 1921. **(R. 452-462).**

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***The above statements are all of the statements made by the respondent concerning which there is any evidence in the record showing even approximately the date at which said statements were made.*** **The approximate date becomes of importance because the Federal Trade Commission Act was not law until September 26, 1914, is not retro-active and state-**

ments made prior to said Act becoming effective and which are not shown by the evidence to have been made since that date, would not constitute a cause of action against a respondent. The statements made prior to September 26, 1914, were admitted in evidence under Specifications One, Two and Three of Paragraph Three of the Complaint, which alleges,

> "That pursuant to a general plan and system of defamation and disparagement of competitors' products, etc."

and solely for the purpose of establishing together with other evidence, the existence of such "general plan and system" if such a "general plan and system" in fact existed.

The respondent company was organized in the year 1899. The statements in evidence began in 1900. They divided themselves into two distinct periods:

1900-1914 The period antedating the Federal Trade Commission Act,

1914-1925 The period after the passage of the Federal Trade Commission Act and after the promulgation of a synopsis of the report of the Referee Board.

## V.

THE COMPLAINT ALLEGES,

That the respondent made these statements pursuant to a general plan and system of defamation and disparagement of competitors' products, and misinformation of the public.

THE RESPONDENT DENIES,

That it has ever had any general plan or system of defamation and disparagement of competitors' products or of misinformation of the public.

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**Does proof show general plan of disparagement?**

Having set out all the statements which the evidence shows to have been made by the respondent, it now becomes necessary to discuss these statements with respect to their

probative effect upon this allegation of the complaint, keeping in view the answer of the respondent.

The proof under this head shows that some years prior to the year 1898 there had come upon the market a number of baking powders which used as a substitute for cream of tartar either potash or ammonium alum. Sometimes one of these alums by itself and at other times in combination with cream of tartar. The alum acid ingredient of the powder was relatively ten times cheaper than the acid ingredient of a cream of tartar powder and consequently the new powders could be put upon the market at a much less price than could a baking powder using as its acid ingredient cream of tartar. The officers of the Royal Baking Powder found themselves confronted with a situation which was becoming quite serious and they were compelled to choose between two courses:

1. To substitute a cheaper acid ingredient, namely, alum, for the more expensive, and compete in price, or

2. To make known the difference between the two acid agencies and then compete in quality and excellence.

They, therefore, made an investigation of the unwholesomeness of alum, obtained all the evidence they could on the subject of alum, obtained the opinion of a number of well-known and well-recognized scientific men and having obtained that evidence, determined to adopt the second course as outlined above, and they thereafter obtained space in newspapers and magazines both for advertising matter and for reading notices and distributed pamphlets and cook books in which they set out, as shown above, the unwholesomeness of alum and that it was a substance deleterious to the human system. This policy they pressed vigorously. (R. 188-190).

**Alum in literature**

At that time, which was between 1876 and 1889, in the literature and the common understanding of man, alum was a thing which no one would think of eating. Its introduction into foods as an adulterant had been made a crime in many countries centuries before. It was classed in the literature almost without question as a corrosive poison, as irritant to mucous membrane, as unwholesome and harmful in human

food. There appeared at that time little in the literature to suggest any doubt about it.

From 1900 to 1914 there appears to have been no pronounced change in the tenor of scientific expression.

**Alum question submitted to Referee Board**

The controversy* between the rival baking powder companies had reached such an acute stage that President Roosevelt, in 1908, appointed a Board of Consulting Scientists to assist the Department of Agriculture in the determination of questions involving the use in foods of substances alleged to be deleterious. This Board became known as "The Referee Board" or sometimes was referred to as "The Remsen Board", Dr. Ira Remsen being its chairman.

**Publication of Bulletin 103 in 1914**

On or about April 29, 1914, there was issued by the Department of Agriculture, a paper known as Bulletin No. 103 which purported to set forth the report of the Referee Board of Consulting Scientific Experts, Ira Remsen, Chairman. The Bulletin concluded with the following statement,

> "The Board concludes that alum baking powders are no more harmful than any other baking powders, but that it is wise to be moderate in the use of foods that are leavened with baking powder."

As to whether any such conclusion as this could be drawn from the report of the Board is a much debated question. At any rate, at the close of 1914 the literature and the published scientific opinions, with the exception of a report of Dr. E. E. Smith and the statement as to the conclusions arrived at by the Remsen Board, appear to have been the only statements emanating from any recognized authority which controverted the up-to-that-time preponderance of published opinion against the use of alum in any form of foods.

After 1914, and after the appearance of Bulletin No. 103 of the Agricultural Department, the respondent continued to disseminate statements alleging that alum in baking powder was unwholesome and might produce deleterious results when

**Not the sole reason for creation of the Remsen Board. Other questions submitted to that Board concerned boric acid, copper sulphate, etc. —R. B. P. Co.*

used daily over long periods of time in food. Many other experiments were conducted on animals and on men. Many scientists disputed the conclusion reached or alleged to have been reached by the Referee Board. The Medical Journals and, to some extent, the Press of the country, devoted considerable space to a discussion of this subject.

**Royal slogan after 1914**

After 1914 the Royal in its advertising matter confined itself largely to the statement "CONTAINS NO ALUM—LEAVES NO BITTER TASTE," but they did not abandon the previously asserted claim that alum was unwholesome and injurious and continued to call attention to it. (See Resp. Exs. 3, 5, 14, 23, 25, 175, 220).

**Plan and system of disparagement not proved**

There is no proof of express malice; it therefore follows that in the absence of such proof it cannot be found that the respondent published and circulated the statements set forth in Paragraph Four supra, "pursuant to a general plan and system of defamation and disparagement of its competitors' products and misinformation of the public," as charged in the complaint.

## VI.

### SPECIFICATION ONE, PARAGRAPH THREE OF THE COMPLAINT CHARGES,

> That the respondent falsely alleged that the baking powders manufactured and sold by its competitors contained alum which the general public understood to be the astringent commonly sold in drug stores and chemically known as Potassium Aluminum Sulphate (PAS).

If this phraseology means that the respondent *falsely* represented that the alum used by several of its competitors in the baking powders manufactured and sold by said competitors was the astringent sold in drug stores, and that the astringent sold in drug stores as alum was only Potassium Aluminum Sulphate (PAS); then it must be found that the evidence absolutely disproves any such charge. The alum sold in drug stores is the Potassium Aluminum Sulphate and the Ammonium Aluminum Sulphate and the use of these two forms of alum vary from time to time as the price of one or

**Drug store alum is ammonia or potash form**

the other becomes cheaper. Both of these alums (PAS and AAS) were certainly as late as 1905 and probably much later, used in the manufacture of baking powder.

If, on the other hand, the allegation referred to means that the public generally understands the alum sold in drug stores to be Potassium Aluminum Sulphate, then there is no proof that the public generally knows whether the alum sold in drug stores is PAS, AAS or SAS. It could as readily be stated that the public knows the difference between $(NH_4)_2 SO_4AL_2(SO_4)_3$, $K_2SO_4AL_2(SO_4)_3$ and $AL_2(SO_4)_3$ as to contend that there is any general public understanding as to the technical name of the alum sold in the drug store. The public only knows that the alum sold in the drug store is a whitish substance of an astringent nature which they purchase either in the crystalized or anhydrous (burnt) form.

## SPECIFICATION TWO, PARAGRAPH THREE OF THE COMPLAINT CHARGES,

That respondent has *falsely* represented the Sodium Aluminum Sulphate (SAS) which is used in several of its competitors' powders as being the same substance as alum, to wit, Potassium Aluminum Sulphate, and that by reason of said *falsely claimed alum* (PAS) ingredient such competitors' powders are harmful, unhealthy, poisonous, deleterious and dangerous to users and consumers of baked stuff made therefrom.

This allegation in short alleges that Sodium Aluminum Sulphate is not alum. Therefore, before discussing the other allegations of this Specifiation, we must first consider the question of fact thus raised,—

## IS SODIUM ALUMINUM SULPHATE ALUM?

**Derivation of the word "alum"**

The English word "alum" is derived from the Latin word "alumen," the Greek equivalent of which seems to have been "stypteria," meaning astringent. The Ancients applied this term to a number of substances of astringent taste,—Chaucer used the word "alum" about 1386. Potash Alum and Ammonia Alum have been known from early times, both have

**been made from alum shale, clay, bauxite and other aluminum materials, both have been used in medicine, and in tanning, dyeing, paper sizing and water purification. As chemistry developed, other salts were discovered of analogous composition and same crystal form in which other elements replaced the potassium or ammonium and "alum" was applied as a generic term to the whole series.**

"Alum. Any of a series of double sulphates isomorphous with common alum, in which the Potassium may be replaced by sodium, ammonium."

*Webster's New International Dictionary,* 1913
(Reprint 1922) **(Com. Ex. 239).**

"Alum. A name given to a remarkable series of double salts, of a* potash alum may be taken as the type . . . We can replace the . . . potash by soda. . . . The following is a list of alums actually known to chemists:

1. Ordinary potash alum
2. Soda alum
3. Ammonia alum
4. Rubidium alum"

**(Nine others are mentioned)**

*The American Cyclopaedia,* 1873 *Edition* (*Appleton*).
**(Com. Ex. 238).**

"In commerce, three forms of alum are usually met with, those of ammonium, potassium and sodium (common alums), which are used as astringents in medicine, as mordants in dyeing, and in the manufacture of baking powder. And anhydrous alum, sodium and aluminum sulphate is chiefly used in the manufacture of alum baking powders."

*Standard Dictionary of English Language,* 1895.
*Also Editions* 1913 *and* 1920. **(Com. Ex. 239)**

"Alum is a double salt, etc. . . . The principal alums of commerce contain potassium, ammonium or so-

* *Should read "which."—R. B. P. Co.*

dium, and the sesquioxide of aluminum. . . . The ammonium alum is used in the manufacture of baking powder."

*The New International Encyclopedia,* 1902. **(Com. Ex. 239.).**

Common alum was regarded as late as the 18th Century essentially as "aluminum sulphate."

"Alum is a neutral salt, consisting of sulphuric acid combined with illuminous earth or fine clay and merits of consequence, the name of *aluminum sulphate* . . . aluminum sulphate, or alum, at first affects the organs with a sweetish taste and is afterwards felt to be strongly astringent."

*Fourcroy Elements of Chemistry and Natural History.*
*London,* 1796.

**Substantial identity of three forms of alum**

Sodium aluminum sulphate is anhydrous soda alum, has the same appearance and taste as exciccated (burnt) potash alum or ammonia alum and there are no substantial differences in chemical or physiological action between any of the three forms of alum used in baking powders (Potash, ammonium and sodium alum).

All three exhibit the same *kind* of reactions in solution although they may differ slightly because of the small variation in the aluminum content.

When used as the sole acid reacting ingredient in baking powder, the aluminum reaction product in each case is aluminum hydroxide.

In addition to carbon dioxide the other reaction products are, respectively:

—Sodium Sulphate only in the case of soda alum

—Sodium Sulphate and some Potassium Sulphate in the case of potash alum

—Sodium Sulphate and some Ammonium Sulphate in the case of ammonia alum

***All forms of alum used in baking powder contains aluminum compounds.***

*The only forms of aluminum compounds used in baking powder have been Potassium Aluminum Sulphate, Ammonium Aluminum Sulphate, and Sodium Aluminum Sulphate.*

*When used in baking powder it is always in its anhydrous form.*

**Usage of word "alum"**

Baking powders containing either Potassium Aluminum Sulphate, Ammonium Aluminum Sulphate or Sodium Aluminum Sulphate have been from the earliest days of the industry classified by *GovernmentBo ard s, GovernmentHealt Officers, Government Bulletins,* whether Federal or State, *Alum Baking Powder.*

**—laws**

*The laws of the states,* where they have any laws on this subject, and the regulations in the various states issued in accordance with its laws, have classified baking powder using SAS as its acid ingredient as *Alum Baking Powder.*

**—regulations**

"The term 'alum' is the common name that should be used to designate either sodium or potassium alum or mixtures of aluminum sulphate and sodium or potassium sulphate or any other aluminum compound."

*11th Annual Report, State Food Commission. Illinois, 1910.*

"SAS or CTS may be properly designated upon the label in baking powders as alum, soda alum, or sodium aluminum sulphate."

*Annual Report, Illinois State Food Commission 1911-1912*

"The greater part of the alum baking powders in the American market are made with alum, the acid phosphate of calcium, bicarbonate of soda, and starch."

*U. S. Dept. Agr. Bul. No. 13, 1889*

*"Classification of baking powders,*

1. Tartrate powders, in which the acid constituent is tartaric acid.

2. Phosphate powders, in which the acid constituent is phosphoric acid.

3. Alum powders, in which the acid constituent is furnished by the sulphuric acid contained in some form of alum salt."

*N. C. Agr. Exp. Sta. Bul. No. 155, 1898*
*Subject: Baking Powders.*

"Baking powders containing, as an essential constituent, aluminum compounds shall be labeled as 'alum'."

*Baking Powder Rulings, July 23, 1913*
*Special Bulletin, Food Department, N. D.*
*E. F. Ladd, Commissioner.*

A hundred other examples could be given from the testimony but space forbids.

—manufacturers

*The Manufacturers of Baking Powder in which SAS is used as an acid ingredient label their cans in the ingredient clause "Alum"*. Out of 115 brands shown by the testimony (Resp. Ex. 112-174), 112 in the ingredient clause designated the acid ingredient of their product "Alum" or "Alum and Phosphate".

—Domestic Science Schools and texts

In *High Schools, Cooking Schools,* by Domestic Science Teachers, in text books used in these schools, baking powders are classified as *tartrate, phosphate, alum, alum-phosphat* and of these books, there have been over 2,473,469 copies sold for use in High Schools and Cooking Schools and Domestic Science Schools in the United States.

—dealers

Among *Wholesale Grocers, Retail Grocers* and *Brokers,* the powders containing as an acid ingredient SAS are known and spoken of as alum powders.

—Arts and Industry

In the Arts and Industry, the term "alum" is applied to sodium aluminum sulphate and technically PAS, AAS and SAS are listed under the head of alum or alumina.

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Active ingredient of alum

Aluminum sulphate is the active reacting ingredient used in baking powders and whether it be potash, ammonia, or soda alum in their anhydrous form makes little difference.

They each and all are alum and it matters not whether soda alum, or its anhydrous form sodium aluminum sulphate, is sold in the drug store or not, it is still alum. Potassium oxide does not cease to be "potash" to the farmer who desires it for the fertilization of his land, because the potash usually sold in the drug store is chloride of potash, it is still "potash" to the farmer.

The question—"Is Sodium Aluminum Sulphate, Alum?" by the overwhelming preponderance of the evidence must be answered in the affirmative. I therefore find that:

**Examiner's conclusion that sodium aluminum sulphate is "alum"**

Sodium aluminum sulphate is "alum" and is commonly so-called. To use the term "alum" without qualification to mean SAS in connection with baking powder is not misleading. To say that it is not alum may be misleading.

## VII.

The proof having failed to sustain the allegation that respondent falsely stated sodium aluminum sulphate to be alum, it follows that Specification Two of Paragraph Three expressed in simple language charges,

*That respondent has falsely stated that certain baking powders which contain alum are harmful to health.* The respondent in its answer avers that all statements made concerning baking powders of its competitors which were published by the respondent or whose publication was authorized by the respondent, are true. This brings the issue squarely up to the question:

HAS THE RESPONDENT FALSELY STATED THAT ITS COMPETITORS' POWDERS CONTAINING ALUM ARE HARMFUL TO HEALTH?

**Evidence as to harmlessness**

The evidence shows and it is admitted that the respondent has represented by direct statements, prior to 1914, and since that time has continued to imply, that alum baking powders are harmful to health. The testimony offered in support of the complaint and in the attempt to establish the falsity of the statements made by the respondent consists of a series

**Experiments of Dr. E. E. Smith**

of experiments conducted by Dr. Ernest E. Smith which was published in October, 1900, in which the experimenter undertook to determine the influence of aluminum baking powder food on secretions in the stomach and reported the results as negative and concluded that there was no astringent action exerted by the aluminized food which would influence secretions in the stomach. Later the same experimenter conducted some tests to determine whether bread made with alum baking powder was absorbed from the alimentary tract to the same extent as bread containing no alum baking powder and to determine in the process of digestion and absorption if there was evidence of any disturbing influences. The diet during the experiment consisted exclusively of bread, meat, milk and butter. The experimenter concluded that this experiment indicated that the food prepared by the so-called alum baking powder was just as available to the human body as the bread without it. The process of digestion was substantially identical, and he concludes:

**—conclusions from first experiments**

> "The evidence from the experiment was that food prepared by the use of so-called alum baking powder does not interfere with secretions in the stomach even when it makes up the larger part of the diet. The investigation does not reveal any reason for believing that such food is injurious or unwholesome."

**—second experiments**

At a still later period, other experiments were run by Dr. Ernest E. Smith, first a feeding experiment with white rats; second, feeding experiment with pigs; and third, feeding experiment with men. These experiments were to ascertain the influence of baking powder upon growth, upon the general well-being of animals and the effect of baking powder foods when used during long periods of time on human subjects, and the fate of aluminum in ingested baking powder food. In the above experiments, the rats were divided into two groups, one was fed on food containing alum baking powder, the other on food containing a laboratory prepared baking powder for a period of three months. The pigs were divided into two groups, one being fed upon food containing alum baking powder and the other on food containing a laboratory prepared baking powder for a period of two and one-half

months. The result of the rat experiment showed the alum rats to have gained less in weight than the control rats, the control being 358 grams and the alum 323 grams. The experimenter reports that all the rats prospered and were perfectly well, normal rats. In the pig experiment, he reports the healthfulness and vigor of the two groups; they were normal and up to the standard for these animals. The usual appetite continued, the pigs at no time refusing the rapidly increasing supply of food. Nothing indicated that one food was more or less acceptable or more or less healthful than the other. Two of the pigs were killed. Their internal organs revealed a healthy condition; no aluminum was found.

The experiments with men consisted in feeding two men for practically five months on bread made with alum baking powder, the subjects eating any other foods which they desired. Experimenter reports that at no time was there any disturbance of digestion or nutrition apparent and the subjects stated at all times that they felt perfectly well and in usual health. During the whole time the bowels were regular and no sensation of depression experienced with digestion. His observation is that the aluminum residues in these foods pass through the alimentary tract unabsorbed and is evacuated in the stool. He concludes from all of his experiments,

**—conclusions from second experiments**

1. The residue of aluminum in baking powder food is not absorbed or stored in the body.
2. Such food does not interfere with the growth and well-being of lower animals.
3. It is not injurious to men even when consumed in large amounts for a considerable length of time.

**—third experiment**

Still later, another experiment on four human subjects was conducted in order to determine the amount of aluminum that could be recovered from the stool after the ingestion of a known amount. Reports that after ingesting food for two days, the amount recovered was 99.9% of the amount of aluminum that was ingested. From these facts the conclusion was reached "that the entire amount of aluminum from the baking powder ingested was present in the stools, and it follows that this is the channel of elimination from the body of this constituent of baking powder residue."

**Bulletin 103**

No other evidence tending to prove falsity was introduced on the direct, except Bulletin No. 103 of the United States Department of Agriculture (Com. Ex. 250) entitled "Alum in Foods." This paper purports to give the conclusions of the Referee Board of Consulting Scientific Experts, Ira Remsen, Chairman, and shows that the following questions were submitted to the Board, to which questions the following answers were given:

**Question submitted and answers rendered by Referee Board**

Q. Do aluminum compounds, when used in foods affect injuriously the nutritive values of such foods or render them injurious to health?

A. Aluminum compounds when used in the form of baking powders in foods have not been found to affect injuriously the nutritive value of such foods.

Q. Does a food to which aluminum compounds have been added contain any added poisonous or other added deleterious ingredients which may render the said food injurious to health (a) in large quantities? (b) in small quantities?

A. Alum compounds,* when added to foods in the form of baking powders, in small quantities, have not been found to contribute any poisonous or other deleterious effect which may render the said food injurious to health. The same holds true for the amount of aluminum which may be included in the ordinary consumption of aluminum baking powders furnishing up to 150 miligrams (2.31 grains) of aluminum daily.

Alum compounds,* when added to foods, in the form of baking powders, in large quantities, up to 200 miligrams (3.09 grains) or more per day, may provoke mild catharsis.

Very large quantities of aluminum taken with foods in the form of baking powders usually provoke catharsis. This action of aluminum baking powders is due to the sodium sulphate which results from the reaction.

* *Correct reading is "aluminum compounds."—R. B. P. Co.*

The aluminum itself has not been found to exert any deleterious action injurious to health, beyond the production of occasional colic when very large amounts have been ingested.

Q. If aluminum compounds be mixed or packed with a food, is the quality or strength of such food to be* reduced, lowered or injuriously affected (a) in large quantities? (b) in small quantities?

A. When aluminum compounds are mixed or packed with a food, the quality or strength of said food has not been found to be thereby reduced, lowered or injuriously affected.

**The Bulletin No. 103 concludes with the statement,**

"In short, the Board concludes that alum baking powders are no more harmful than any other baking powders, but that it is wise to be moderate in the use of foods that are leavened with baking powder."

**The last statement in Bulletin No. 103 is not a statement made by the Remsen Board, but is a conclusion of the author of the Bulletin.**

**Discussion of evidence as to harmlessness**

**No other proof bearing upon the falsity of the respondent's statements was introduced on the direct. The probative effect of the conclusions drawn by Smith as the result of his experiments is very much lessened by the manner in which the experiments were conducted. In the rat experiment, milk was added to the food throughout a large part of the experimental period and milk is an admitted antidote to aluminum poison, and notwithstanding that the antidote was given along with the alum baking powder bread, still the group fed upon the baking powder food did not gain as much as the group fed upon the control bread. In the pig experiment, the probative effect of the conclusions reached by the experimenter is lessened because of the fact that in the control group he had pigs whose starting weight was largely at variance,**

* *"to be" not in original text of Bull.* 103.—*R. B. P. Co.*

one being 45 pounds, the other 25½ pounds, a total weight in this group of 70½ pounds; whereas in the alum group, he had two pigs, one weighing 34 pounds, the other 39 pounds, a total of 73 pounds. At the conclusion of the experiments, "the weights for the control pigs were 151½ pounds for one, 107 pounds for the other, a total of 258½ pounds, an increase in weight for the two pigs of 367%, while the alum pigs weighed 116½ pounds for one, 141½ pounds for the other, a total of 258 pounds, an increase of 353%." These figures show a decreased percentage of growth on the part of the alum pigs compared with the control pigs, and it is evident that if the undersized pig which was placed in the control group had at the start of the experiment been placed in the alum group, that the decrease in percentage on the part of the alum group would have been much greater. Again, while the experimenter states that double the amount of baking powder recommended by the manufacturer was used, yet throughout the experiment the animals were given large quantities of milk, 890 quarts being consumed during the period, or an average of 221½ quarts to each pig. Thus again was the alleged poison and its antidote administered together. As for the experiments on human beings, to the lay mind they would add no weight one way or the other, for it is testified by the witness (Rec. 4276) that the bread which was fed to these subjects, at least in some of the experiments, was baked for 1¾ hours, in a temperature of 180°C. which equals about 360°F. which, as the evidence shows (Rec. 4278) would have a tendency to dehydrate the aluminum hydroxide, which is the residue left in an alum baking powder and would tend to render the aluminum hydroxide less soluble. Very rarely, if ever, does food prepared with baking powder for human consumption remain in an oven exposed to any such temperature for any such period of time.

**Bearing of Referee Board Report**

As for the findings of the Remsen Board, they do not appear to have any direct bearing on the question at issue, namely, the truth or falsity of respondent's statements. At best, they only state that as the result of experiments which

that Board conducted; it (alum) *has not been found* to affect injuriously the nutritive value of foods, *have not been found* to contribute any poisonous or deleterious effects which may render the said food injurious to health.

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If, in an action of this nature, it is incumbent upon the complainant to establish the falsity of the statements alleged to have been made and which have been proven to have been made—then it would be unnecessary to consider the proof tending to show the truth of the statements, the falsity of the statements not having been proven.

**Evidence as to harmfulness**

However, it may be that when statements alleging competitors' products to contain ingredients harmful to health are proven to have been made, that a presumption may arise that such statements are false and the burden may be upon the respondent to rebut this presumption and to prove that its statements are true. This does not impress the Examiner, but as it may be held to be a correct statement of the law, it becomes necessary to set up the proof introduced on behalf of the respondent tending to establish the truth of the statement that "its competitors' powders containing alum are harmful to health," or other statements proven to have been made by it analogous to this statement.

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Protoplasm is the viscid, semi-liquid, somewhat granular substance that forms the principal portion of an animal or vegetable cell.

**Aluminum salts protoplasmic poisons**

That aluminum salts are protoplasmic poisons when brought in certain concentration in direct contact with protoplasm, is an accepted and well established fact. It has also been proven and is accepted by scientists and the medical profession, that aluminum salts when administered intravenously in large doses, is a poison. It is also well known and accepted that aluminum salts administered orally in large doses is a poison and produces violent irritation, vomiting and in some cases, death.

It is a contention of the proponents of the harmlessness of alum that although alum is present in the baking powder, yet when that baking powder is used a chemical reaction takes place, the alum disappears and a perfectly harmless reaction* takes place in the product. The aluminum is said to be left in the form of aluminum hydroxide or aluminum phosphate which are stated to be insoluble, not capable of being absorbed and therefore entirely free from harmful effects.

**Solubility of baking powder residues**

The respondent alleges that these residues are soluble in the gastric juice and in the duodenal tract, and are not only absorbable but are absorbed in varying amounts in the digestive tract. It therefore is necessary to consider the evidence upon this,—

## SOLUBILITY AND ABSORPTION OF ALUMINUM RESIDUES IN BAKING POWDER

Proof of solubility and absorption as shown by the scientific literature in evidence—

**Shown in official bulletins**

North Carolina Agricultural Experiment Station, Bulletin No. 155, December 1898. Baking Powders,—

> "The residue of aluminum hydroxide is insoluble in water. The residue is soluble in the juices of the body and is thus absorbed by it." (Resp. Ex. 5).

Under the head of "Alum and Phosphate Powders", the author sets up an equation showing the residue and remarks:

> "It will be seen that the alum contained in this residue is held as phosphate of aluminum, which is about as soluble in the juices of the body as the aluminum hydroxide residue from the straight alum powders."

Bulletin No. 68, Laboratory of the Inland Revenue Department, Canada, 1900, quotes Henry Morton, President of Stevens Institute:

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* *Probably intended for "a perfectly harmless residue results in the product."*

"I took a portion of this (alum) powder and mixed it with flour in the directed proportions, and baked a small loaf with it, then I soaked this loaf in cold water and made an extract in which I readily detected alumina in a soluble condition."

Report of Connecticut Experimental Station, 1900, on Alum and Alum-Phosphate in Baking Powders,

"Hydrate and phosphate of alumina in a moist condition are white gelatinous substances, insoluble in water, but soluble in dilute hydrochloric acid, . . . There is also good reason to believe that both the hydrate and phosphate of alumina are soluble in the muriatic acid of the gastric juice and may have a physiological action similar to that of alum." (Resp. Ex. 221).

**—scientific publications**

Henry A. Mott, Jr. (Journal of American Chemical Society, Vol. 2) gives result of experiments on dogs with an alum baking powder in which ten to twelve teaspoonfuls of powder were used to one quart of flour and describes the symptoms developed in the dogs. Also describes the feeding to dogs of meat mixed with precipitated hydrous aluminum. He recovered aluminum from the blood and the liver of the dogs. Also gives what Arnold and himself recovered from the blood, kidney, heart, spleen and liver of a dog which had been given twelve ounces of the precipitated aluminum hydroxide by mouth during a period of four days. He calculates that 30% of alum was in the baking powder and that a biscuit weighing 24¼ ounces* contained three grains of aluminum hydroxide (Resp. Ex. 220).

Professor J. W. Mallett, University of Virginia, in published reports (1888) of a series of experiments found aluminum hydroxide and aluminum phosphate soluble in gastric juice.

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* *Typographical error. The article by Mott reads:*
*"If the alumina in biscuit be calculated as hydrate of alumina, then one pound of biscuit would contain over 54 grains.*
*"One biscuit would contain 3 grains of hydrate of alumina. A person would eat about four of these biscuits at a meal, and would therefore introduce into his stomach 12 grains of hydrate of alumina."—R. B. P. Co.*

Dr. Anthony McGill, of the Health Department of Canada, conducted experiments relative to solubility of aluminum in the gastric juices and in a Canadian Government Bulletin in 1900, reported the solubility of hydrate of alumina in gastric juices. (Resp. Ex. 175).

The literature abounds in similar statements.

*Proof of solubility and absorption as shown by sworn testimony of witnesses during hearings.*

**Testimony on absorption**

John Allen Killian, Master of Arts in Chemistry. Doctor of Philosophy. Instructor and Professor of Analytical Chemistry at Fordham Medical School, New York (Rec. 3768), and

Victor C. Myers (Rec. 3734) of Iowa City. Professor of Biological Chemistry, University of Iowa. Pathological Chemist. Ph.D. at Yale. Professor of Physiological Chemistry, Albany Medical College,—collaborated in a set of experiments on men and on dogs and, as testified by Dr. Myers,—

First experiment largely made on patients in medical wards. Used Davis, Parrot & Monkey and Good Luck baking powders. Experiments were to ascertain the solubility of aluminum salts in the gastric juices of the stomach. In first experiment the amount of soluble aluminum amounted to about 10% of the total aluminum.

In the second experiment it amounted to about 33% of the total aluminum. Solubility in the stomach does not necessarily mean that the aluminum which does dissolve will necessarily be later absorbed in the digestive process. Witness describes further experiments with the duodenum juices. In one case they found .25 miligrams of aluminum per 100 c.c. Second case, found 1.03 miligrams. Third case, 1.5 miligrams. In this case we also determined the total aluminum which amounted to 13 miligrams. The soluble aluminum therefore constituted a little more than 10%.

Dr. Killian testifies to an experiment on a dog in which it was attempted to study whether the aluminum in biscuits fed over a period of time was absorbed to such an extent that it could be detected in the organs of the body. The dog was

fed biscuit in which its total intake per day was 190 miligrams of aluminum. The dog was killed and he reports finding aluminum in the blood and from the liver he obtained .33 miligrams of aluminum per 100 c.c. or .62 miligrams of aluminum oxide per 100 c.c., the total volume of the liver being 330 c.c.; also obtained aluminum from the kidneys and in the bone.

**Philip B. Hawk, Ph.D. Physiological Chemist. Head Master of Boys' School and Director of Food Research Laboratory author of books on Practical Physiological Chemistry, testifies (Rec. 1709) that he undertook work on the question of absorption of aluminum.** Two normal men were fed biscuit made with alum baking powder. Blood was taken from the subjects after ingesting this diet for some six weeks and aluminum found in the blood of both men. Also determination made of aluminum in the gastric juices in human subjects after feeding the same aluminized biscuit and it was found that aluminum was present in the gastric juices also in the urine of both subjects which would indicate that aluminum had been absorbed into the blood.

**Dr. Frank C. Gephart, who analyzed six samples of blood taken from human beings (three, Talladega, Ala.; three South Carolina State Hospital) all of whom had received unknown and variable amounts of aluminum in baking powder food,—** found one to four parts per million in five out of the six samples (Rec. **3594-3604**).

**Willis S. Hilpert, Chemist, Miner Laboratory, Chicago (Rec. 3231), testifies** he obtained samples of blood from individuals at the Penitentiary, Little Rock, Ark., and who had been there, all of them, for at least one and one-half years and during that period had partaken daily of food prepared from alum phosphate baking powder. This blood was analyzed and he found aluminum in small quantities in the blood of the four samples which he analyzed, the amounts being 1.7 to 3.2 parts per million.

**Harry Truman Beans* (Rec. 4530), Professor of Chemistry, Columbia University, testifies that he had recently under-**

* *Error for "Hal Truman Beans."—R. B. P. Co.*

taken experimental work to determine by analysis the reaction products of a baking powder containing sodium aluminum sulphate and calcium acid phosphate. Found it to be partially soluble in the faintly alkaline solution resulting from the treatment of these mixtures with water. It is completely soluble in .03 normal hydrochloric acid at 37° C. (Rec 4534). Baking powder of the composite type which has in addition to sodium aluminum sulphate a certain amount of calcium acid phosphate produces aluminum compounds upon reaction which are more soluble in dilute hydrochloric acid than does a baking powder of the straight alum type containing sodium aluminum sulphate as its sole acid reacting ingredient.

**Experiments show residues from alum-phosphate type more soluble**

**Max Kahn, Director, Laboratory Beth Israel Hospital. An Associate in Biological Chemistry, Columbia University (Rec. 1383).**

During the summer of 1911, conducted some experiments with a view of finding out whether aluminum is absorbed from the alum baking powder when baked in bread and whether the aluminum was stored up in the various tissues of the body. Experiments lasted four or five months; used Bob-White Baking Powder which is straight alum baking powder. Result of these experiments was published in Biochemical Bulletin, 1911, under the title "Absorption and Distribution of Aluminum from Aluminized Foods." Witness describes the diet that the dogs were fed and the periods of time which extended from two months in some cases to fifty-two days in others. The dogs were bled to death and the blood and tissue analyzed. Witness concludes,

**Absorption experiments**

> "When biscuit baked with alum baking powder are fed in a mixed diet to dogs, the aluminum passes in considerable amounts into the blood. Such absorbed aluminum circulates freely and although it does not show a tendency to increase proportionately in the blood, it accumulates to some extent in the various parts of the body, the bile containing a particularly large amount of aluminum under such circumstances. The pancreas and spleen, the liver, muscle and kidney contain considerable amounts

while the brain and heart seem to resist the accumulation of aluminum."

Alum, when ingested in aluminized food under the conditions of these experiments, is absorbed in part and is excreted to some extent in both the bile and urine.

**Dr. Matthew Steele,* Professor, Biological Chemistry (Rec. 1427) Ph.D. Instructor, College of Physicians and Surgeons, Columbia University.**

Made experiments starting in 1909 on the absorption of aluminum from aluminized food and published the details of his experiments and the results in the American Journal of Physiology, May 1, 1911. Investigation consisted of fifteen experiments on dogs. Eleven of these experiments pertained to the passage of aluminum into the blood from aluminized food and four experiments related directly to the passage of aluminum from the blood into the feces. Full grown normal healthy dogs were used. In some of the experiments biscuits prepared with alum baking powder were used in the diet.

> "The results of the experiments 10 and 11 show clearly that the aluminum in alum baking powder is not rendered wholly insoluble in the bread baking process. Amounts of aluminum equal to some of those recovered after the administration of plain alum in powdered form were found in the blood of the dogs that received the alum baking powder biscuits."

The general conclusion was that when alum was administered in aluminum free food to dogs, or when dogs ingested biscuit baked with alum baking powder, aluminum in comparatively large amounts promptly passed into the blood.

Absorbed aluminum circulated freely, but as it did not show any pronounced tendency to accumulate in the blood its full effects must have been registered ouside of the circulation.

When aluminum chloride was administered intravenously, from 5.55% to 11.11% of the aluminum passed from the blood

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* *Spelling should be "Steel."—R. B. P. Co.*

into the feces during the three days immediately after the injection. **(Resp. Ex. 110).**

**Dr. Arnold K. Balls, Master of Science, University of Pennsylvania. Took up Pure Science, Columbia University. Member of Society of Experimental Biology and Medicine. Author of several publications. Conducted a series of experiments, published 1920 (Resp. Ex. 111; Rec. 1560), to determine the occurrence of aluminum and its absorption from food in dogs.**

The witness conducted several experiments, the details of which are set out in full in Respondent's Exhibit 111 and testifies that he found from bread baked with aluminum baking powder practically all the aluminum is extracted by artificial gastric juices and after gastric digestion of such bread, some aluminum still remains dissolved when the duodenal juices affecting the digestive mixture (are) simulated invitro.

In normal dogs, aluminum exists, if at all, in amounts too small to be demonstrable by the best available methods.

Aluminum is absorbed by dogs from food containing aluminum phosphate, and from bread baked with alum baking powder. Much of this aluminum is speedily eliminated, but some is retained, replacing part of the iron occurring normally in the tissues.

**Dr. Russell H. Chittenden (Rec. 4092)** thinks it probable that the residue or residues from alum baking powder baked in bread would comprise aluminum compounds more or less soluble in hydrochloric acid.

**In a letter (Rec. 4093) writen to the Royal Baking Powder Company, November 11, 1904, Dr. Chittenden said:**

**Letter from Dr. Chittenden**

"From each of the 25 samples of alum baking powders collected from the retail stores of New England, I have made bread as per your instructions, using the powders according to the direction upon the labels. The breads were then examined for the purpose of ascertaining the character of the residuum left therein from the baking powders. I found in each of the breads thus made some form of alu-

mina salt soluble in two-tenths per cent of hydrochloric acid—acid of the strength of the gastric juice—thus implying that aluminum salts would be dissolved out of the breads when the latter were taken into the stomach."

**Conclusions of Examiner on solubility and absorption**

There is no affirmative proof in the record that aluminum hydroxide or aluminum phosphate, the residue of alum or alum phosphate baking powders, are insoluble in the gastric juice and in the duodenal juices; nor is there any such proof that they are not absorbable in the stomach and intestines.

The proof in this record is that the residues from alum and alum-phosphate baking powders are soluble, are absorbable and are absorbed in many instances.

## VIII.

### EFFECTS OF ALUMINUM SALTS UPON ANIMALS AND MEN AS SHOWN BY THE EVIDENCE

**Scientific literature**

The scientific literature is full of experiments and opinions by scientists in connection with the effects and* aluminum salts; only a few will be cited here.

**Cushny —1920**

Arthur H.† Cushny, whom Professor Chittenden endorses very highly as an authority in "Pharmacology and Therapeutics, or the Action of Drugs, in Health and Disease," published in Philadelphia, 1906, and republished without any change in this quotation in 1920, under the head of "aluminum and alum," writes,

> "Aluminum has a very remarkable general action when it obtains access to the blood. In Siem's experiments on animals, the sodium-aluminum lactate or tartrate induced a very slow intoxication, mammals never dying from the effects sooner than one or two weeks after the intravenous injection of the salts. In frogs the symptoms were those of a descending paralysis of the central nervous system, the heart and the peripheral nerves and muscles being little affected. In mammals the first symptoms ap-

*Probably intended for "of."—R. B. P. Co.
†Corrected initial is "R."—R. B. P. Co.

peared only after three to five days, and consisted in constipation, rapid loss of weight, weakness, torpor, vomiting; marked abnormalities in movement and sensation were observed later, such as tremor, jerking movements, clonic convulsions, paresis of the hind legs, anaesthesia of the mouth and throat and lessened sensation all over the body. Before death, diarrhea often set in and albuminuria was generally present. The mucous membrane of the stomach and bowel was found swollen and congested, the kidney and liver had often undergone fatty degeneration and hemorrhages were found in the renal cortex. Albuminum was found in the urine.

Like the other members of the heavy metal series aluminum therefore acts on the bowel and kidney in general poisoning, while many of the symptoms point to a direct action on the brain. Dollken has recently confirmed Siem's results, and showed that the nerve cells and fibres of the cord and medulla undergo degeneration, particularly those of the lower cranial nerves.

It has been stated that the alum salts of the food are absorbed and stored in the bones, but this is incorrect. What little is absorbed is probably rapidly excreted by the bowel and perhaps by the urine." (Resp. Ex. 258).

**Experiments of Prof. Mallett —1888**

**Professor J. W. Mallett, University of Virginia, published a series of experiments, 1888.** In these experiments he used one brand of straight alum baking powder, sixteen brands of alum-phosphate powder. Baked bread with these powders. He found aluminum sulphate* and aluminum hydroxide existing in the hydrated form in the bread made with these powders. Administered these compounds to men. Reported,

". . . in doses not very greatly exceeding such quantities as may be derived from bread as commonly used, aluminum hydroxide and aluminum phosphate produces, or produced in experiments upon myself an inhibitory effect upon gastric digestion. From general nature of the

*Correct reading is "aluminum phosphate."—R. B. P. Co.

**Conclusion of Prof. Mallett**

results obtained, the conclusion may fairly be deducted that not only alum itself, but the residues which its use in baking powder leaves in bread can not be viewed as harmless but must be ranked as objectionable and should be avoided when the object aimed at is the production of wholesome bread." **(Resp. Ex. 220, page 83; also Resp. Ex. 125, page 17).**

In a report, United States Department of Agriculture, Division of Chemistry, Bulletin No. 13, subject: Foods and Food Adulterants, by C. A. Crampton, 1889, quoting from Hassel upon the effects on the system of aluminum:

**U. S. Bulletin —1889**

"But its action in neutralizing the efficacy of the digestive solvents is by far the most important and unquestionable, for while it prevents solution while the bread is being prepared, it also continues its effect when taken into the stomach and the consequence is that a large portion of the gluten and other valuable constituents of the flour are never properly dissolved but pass through the alimentary canal without affording any nourishment whatever." **(Resp. Ex. 3, page 572, Bulletin No. 13).**

The same Bulletin, quoting from Ohio State Dairy and Food Commissioner for 1887, says:

**Ohio Bulletin —1887**

"From this fact many persons condemn the entire class of alum baking powders as being unhealthy.

Pure alum is undoubtedly a harmful sale* and resultant salts from its combination with soda can scarcely be less hurtful."

**Conclusions of Bigelow & Hamilton**

W. D. Bigelow and C. C. Hamilton (Journal American Chemical Society, Volume XVI, pages 587-597) conclude that the influence of aluminum hydroxide on digestion is about the same as that of an equivalent quantity of alum.

**Experiments of Ruttan**

Profesor Ruttan of McGill College, Montreal, published the result of a series of experiments on the digestibility of bread baked with alum, and among other things, concludes:

*Correct reading is "salt."—R. B. P. Co.*

"The presence of alkaline sulphates and of the pulpy viscid hydrate and phosphate of alumina is sufficient to explain the relative indigestibility of bread containing these salts. . . . While the effect of alum is to entirely prohibit ferment action, that of the products resulting from the use of an alum powder is merely to retard digestion, not to entirely prevent it. The unanimous verdict of my experiments is that alum powders introduced into a form of food of universal use, are agents which are detrimental to the functional activity of the digestive ferments. They must therefore be prejudicial to health and the only course is to carefully avoid them."

**Conclusions of Ruttan**

J. West Knights, F.C.S. (the Analyst, 1880 page 67) published the results of a series of experiments to determine the influence of alum upon the digestibility of gluten. He concludes:

**Experiments of West Knights**

"This powerful action of mere traces of alum or salts of alumina upon soluble gluten and diastase is, I think, sufficient foundation upon which to assert that alum either in a soluble form or mixed with carbonate of soda, is injurious to health when introduced into bread; the extent of the injury may or may not be small."

H. A. Mott (Journal of American Chemical Society, Volume II) describes experiments made upon dogs fed with biscuit prepared from alum baking powder. Sickness and vomiting followed by constipation were well marked in each case where five dogs were experimented upon. Three dogs fed with biscuit made with the same amount of cream of tartar powder ate well and were in no way affected. Also reports digestion very long delayed or entirely prevented.

**Experiments of Mott on dogs**

Henry B. Cornwall. "Composition and Comparative Healthfulness of the Baking Powders sold in this State." Reports of the Dairy Commissioner of the State of New Jersey, 1888, Trenton, 1889.

N. J. Bulletin —1888

". . . Not even the boldest advocate of alum powders have denied the injurious tendencies of soluble aluminum compounds in the bread."

* * *

"In the writer's opinion, the presence of alum in baking powders is objectionable, since, under certain conditions, it may exert an injurious effect on the digestion. The effects may not be very marked in the case of any individual consumer, but that they can be induced to a greater or less extent, seems to be well established." (Resp. Ex. 220, pages 82-92).

Witnesses who testified at hearings.

Testimony of Dr. McGill

Dr. Anthony McGill, retired member of the Health Department, Canadian Government, Fellow of Royal Society, Fellow of the Society of Chemical Instruction, American Chemical Society, American Association for Advancement of Science, and many other societies. He testified as to his long experience as a health officer and identified the various bulletins issued by the Canadian Health Department known as the "Laboratory of the Inland Revenue Department." Reports experiments made by himself:

"The inhibitive effect of alum upon gastric digestion is well-established and the great insolubility of desiccated alum compels the inference that alum as such remains in the bread, in all cases where an alum baking powder has been used."

In 1889 in published Bulletin, I expressed my conviction, based on experimental evidence at that time available, that alum in baking powder is dangerous to health. The large mass of evidence which has accumulated since has more strongly convinced me of the correctness of that opinion. A disturbance of gastric digestion would seem to be inevitable.

—conclusions of Dr. McGill

"It is, moreover, capable of entering into combination with, and thus rendering unavailable for nutrition, any otherwise available phosphates which food may contain. This is probably the worst office served by the alumina introduced into the digestive system as alum

powder. The sulphate of soda is a powerful drastic purgative in doses of half an ounce, calculated upon the crystallized salt, and corresponding to 0.22 ounce of the anhydrous salt." **(Resp. Ex. 175, pages 12-15).**

**Testimony of Dr. Hawk —rat experiments**

Philip B. Hawk (Rec. 1711), in 1921 and early part of 1922, conducted some experiments. Used rats which were fed on biscuits made with alum baking powder and another group with biscuits made from tartrate baking powder. He testifies,

"We had in all 36 rats, dividing them into six groups of six each. Three groups of six rats each were fed on the alum biscuits, and three groups of six rats each were fed on the tartrate biscuits. We found in a general way that the rats eating the alum biscuits grew less rapidly and satisfactorily than did the rats eating the tartrate biscuits. We found that the rats—they were all females —became pregnant sooner on the tartrate powders and they gave birth to more litters and to a larger number of individual rats in those litters. Of the eighteen alum rats, only eight became pregnant, whereas ten of the tartrate rats became pregnant. Of the progeny there were 54 from the alum experiments and 76 from the tartrate experiments. My interpretation of these results was that the feeding of biscuits made with alum baking powder interfered with the growth of individual rats, caused delay in pregnancy and the bearing of fewer young." **(Resp. Ex. 328 and Rec. 1714).**

**—results**

**—interpretation of results**

**Testimony of Dr. C. A. Smith**

**Clarence A. Smith, who assisted Hawk in the experiment above, testified** that the fecundity of the tartrate rats was over 40% greater than that of the alum rats. The young tartrate rats grew somewhat more rapidly than did the alum rats. **(Rec. 1750).**

**Testimony of Dr. Gies —rat experiments**

**Dr. William J. Geis, Member of the Faculty, Medical College, Columbia University. Graduate of Yale University. Special Student of Physiological Chemistry.** Since 1903 or 1904 has devoted particular attention to the matter of aluminum, its physiological and like effects.

Four experiments, using young growing Albino rats, were made under the supervision of Dr. William J. Geis, assisted by Doctors Maxwell, Karshan and Hattie Heft, all of whom testified at the hearings substantially as follows:

**First rat experiment on growth**

Four groups, each group containing six to eight rats, were selected for experiments on growth. Biscuit leavened with yeast, phosphate baking powder, tartrate baking powder, alum baking powder were used, and with the exception of the leavening agency used in the biscuit, the food of the animals in each group was identical. The diet from Monday to Saturday inclusive consisted exclusively of biscuit. Cheese and cabbage, but no biscuit, were fed each Sunday. The experiment lasted from February to October, 1920. The diet was undoubtedly deficient in nutritive value, but all the animals fared alike.

**—results**

At the end of 55 days, the yeast rats had gained 106 grams, tartrate 97, phosphate 95 and alum 76. All of the animals seemed to be normal throughout the experiment except those of the alum group. Mild diarrhea was occasionally apparent with the alum group. Five or six rats of the alum group exhibited marked symptoms of aluminum poison, namely, discoordinated movements, tremor and awkwardness in the use of the hind legs. These symptoms gradually diminished in severity but four or five days later, tremor and paralytic conditions reappeared, followed by weakness and vomiting. This was followed by gradual recovery during the following six days. Unmistakable symptoms of direct aluminum poisoning occurred as noted, and must be ascribed to the use of biscuit made with ordinary yet typical alum baking powder.

**—conclusion**

**Second rat experiment**

In a second experiment, 36 female rats were divided into four groups, the food being the same as in the former experiment except that yeast was not used and a phosphate powder introduced in its place. The gain in weight of the various groups after 63 days was phosphate (b) rats 56 grams, tartrate 52, phosphate (a) 46 and alum 25, which showed a striking deficiency in the nutritive quality of the alum biscuits. The deficiency of the alum biscuits was clearly a matter of positive poisonous quality. The rats in the alum group ate

**—results**

less per day than the rats of any other group although the same quantity of food was before them. No observed symptoms of acute toxicity in this experiment. —conclusion

These rats were carried into a third experiment, the purpose of which was to study the effect of alum baking powder compared with phosphate and tartrate baking powder on reproduction, fecundity and normality of the offspring. Feeding continued as before. The results were, fecundity of rats in the alum group was lower in degree than that of the rats in the other three groups. Only four of the six rats in the alum group gave birth to litters, one of the six dying pregnant, the other non-pregnant. All the rats of the other three groups bred normally and survived in good condition. The offspring of the rats of the alum group were smaller in number per litter, smaller in size at birth and smaller in size at the age of one month. It is obvious that the diet of the alum biscuits markedly interfered with the normal offset,* progress and outcome of pregnancy and noticeably impaired the nutrition of the offspring of otherwise healthy and prolific Albino rats. **Third rat experiment —on reproduction, etc.** —results —conclusions

A fourth experiment, duplicated in everything except that this was conducted on male rats. At the end of the 58th day, tartrate rats gained 93 grams, phosphate (b) 88, phosphate (a) 82 and alum 53. No observed symptoms of acute toxicity. Alum rats less active and more somnolent. The relative ineffectiveness of the biscuit leavened with alum baking powder was due to direct toxic action,—not the deficiency of nutriments in the biscuits. This direct toxic action was† one or more soluble aluminum compounds or sulphate by-products or both. **(Resp. Ex. 327 for full report).** **Fourth rat experiment** —conclusion

**Dr. Victor C. Vaughan, Ann Arbor, Michigan. Graduate, University of Michigan. Doctor of Philosophy. Doctor of Medicine. LL.D. Forty-five years a teacher in the University of Michigan. Dean of Medical Faculty from 1891 to 1921. Studied in University of Berlin. Studied in Laboratories and Clinics in London, Paris, Vienna, and Rome, as well as Berlin. Began teaching toxicology in 1876. Has made a special study** **Testimony of Dr. Vaughan**

* *Obviously intended for "onset".—R. B. P. Co.*
† *Correct reading is "due to one or more."—R. B. P. Co.*

of poisons and their effect upon man and animals. Member of the Typhoid Commission appointed by the Government after the Spanish-American war. Was in charge of communicable diseases in the United States during the World War with the rank of Colonel. Received distinguished service medal and made a member of the Legion of Honor of France for his services. Has served on many public health boards. Member of the National Academy of Science, and many other associations.

**—definition of poison**

"A poison is a substance of a definite chemical composition, which by virtue of its constitution is capable, when brought in contact with the tissues of the body, of modifying the cellular activity of one or more organs to such an extent as to impair health and possibly to destroy life."

"Practically, alum is the only salt of aluminum from which poisonous effects are likely to result. This is true merely because alum is the only soluble salt of aluminum that is widely used. All salts of aluminum are poisonous when injected subcutaneously or intravenously. The researches of Siem, confirmed by those of Doelken, have demonstrated that the lesions induced by the subcutaneous administration of salts of aluminum, are extensive and serious. In animals they found the lesions of 'metallic kidney' and fatty changes in the anterior horns of the spinal cord."

**Experiments of Dr. Vaughan on digestion**

"In 1909 I made some experiments on the effect of aluminum hydrate upon gastric digestion. This was done in test tubes in laboratories, not done in the animal body, and I found that the addition of aluminum nitrate* delayed the digestion of egg white by the gastric juice. I found that a given gastric juice, without any alum in it digested 93.9% of the egg white in a given time; while with the addition of aluminum hydrate, it digested within the same time, only 57.5%."

In 1900, even before Dr. Mallett's work, I said that aluminum must be absorbed and testifying before a Senate Committee I testified that it would be difficult for all of the alum to escape absorption. My conclusion is that the salts of aluminum are harmful in the human body.

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* *Correct reading is "hydrate."—R. B. P. Co.*

Discussion of poisons

Many poisons, especially those administered by the alimentary canal—and this is true of metallic poisons as well as many others, are absorbed into the circulation. In fact, they must be absorbed before they can act as systemic poisons. Perfectly insoluble substances, of course, would not be absorbed. Even metallic arsenic is not poison until it is converted into the oxide. Metallic copper is not a poison unless it is very finely divided, in which case it may be digested with the gastric juice, and so on.

I say, most of these poisons by absorption are carried by the blood and the lymphs to every part of the body, or to various parts of the body. It does not have to go to every part of the body, and they have opportunity to be brought in contact with all the features of the body; and as I have stated here in this definition, they have their selective action; they will combine with certain tissues, other tissues they will not combine with. They may add something foreign; and they may take something away; they may merely rearrange the structure of the living tissue. By either one of these means, they may harm the tissue. Then the body strives to get rid of these things by eliminating them and pouring them back into the intestines, and they may then be reabsorbed again, and may go around.

The point I want to make is that if you could prove that every particle, iota, of this substance, administered by mouth, is eliminated by the feces, through the feces, or with the feces, it would not show that it had not poisoned the animal. A man may die from arsenical poison, and after his death no arsenic found in his body. The poisoning is accomplished while this substance is traveling around. Then the tendency of the blood is to eliminate, in part at least, all poisons, into the alimentary canal; that is the way of getting rid of it; and the same thing is true of typhoid bacilli, and of various other poisons.

Q. Now, Doctor, in the testimony to which you have referred as having been given by you in the year 1900, before the Senate Committee of manufacturers, at a hearing in Wash-

ington, did you come to the conclusion as a result of your studies and experiments up to that time that the salts of aluminum are harmful in human food?

A. That was my conclusion, yes.

**Vaughan's conclusions**

Q. And did you come to the further conclusion that alum baking powders were not healthful, and not wholesome when used in the preparation of human food?

A. I did. **(Rec. pp. 2289-2306).**

**Testimony of Dr. Mathews**

**Albert P. Matthews (Rec. 4659). Chemist. Member of many American, English and French Biological Chemist Societies. Has particularly studied the toxicity of various metals; also non-metallic elements. Was a member of the Commission which examined the effects of saltpeter on the health of human beings; the other members being Professors Chittenden, Abel, Edsall and another. (Rec. 4661).**

Q. What, in your opinion, are the effects of the aluminum residues as they occur in biscuit prepared with alum phosphate baking powder upon the digestion, metabolism and health of men?

**Opinion by Dr. Mathews**

A. They will check somewhat the rate of digestion in the stomach by combining with the peptic ferments and possibly with the proteins during their digestion. In the intestinal tract the aluminum of these residues will combine with and check the action of the various digestive enzymes and in this way slow the rate of digestion not only of the proteins but of the fats and carbohydrates as well.

**—effect on digestion**

Probably a more serious result will be that it will unite with various essential constituents of the food present in small quantities, substances called food accessories,* substances or vitamines and these substances will be thereby so changed as no longer to exert their usual action on the body.

**—action on vitamines**

In animals, and their restrictive† diet having barely sufficient of these substances to support the life of its tissues, a

*Correct reading is "accessory substances."—R. B. P. Co.
†Correct reading is "on a restricted diet."—R. B. P. Co.

very serious condition will be produced in the alimentary canal, owing to the lack of these essential substances.

—on intestine

This condition will be very similar to the conditions described by Chittenden and Underhill as a pelagrous condition. There will be hemorrhagic condition of the intestine with ulceration of the duodenum and at times of the stomach also.

—action after absorption

The aluminum from such residues after absorption into the blood and lymph will exert the usual action of aluminum salts on the tissues and organs of the body, this action being more or less severe depending on the quantity of aluminum absorbed.

Regardless of absorption, aluminum can exert an irritating action on the mucosa of the gastro-intestinal tract without absorption and in the manner already stated it may exert the deleterious action on the food, so changing its quality as no longer to exert the nourishing effect it would have exerted in the absence of aluminum. (Rec. 4664).

Precipitating action of aluminum compounds

Himebaugh, Remington, Seibert and Heilburn* testified to and demonstrated the precipitating action of aluminum compounds in their coagulating effects upon red blood cells, sea urchin eggs and living tissues. (Himebaugh Resp. Ex. 232-237; Remington Rec. 2577-2594; Seibert Rec. 2813-2818; Heilburn* Rec. 2549-50. There is no doubt of the precipitating action of aluminum compounds.

Tests of digestibility

Tests of the digestibility of alum biscuit and alum phosphate biscuit in comparison with control biscuit (sodium and sulphate)† demonstrated,

—results

*Pancreatic—fat digestion*

Alum—63.1% and 67.7% of the control
Alum-phosphate 50% and 64.8% of the control

*Protein digestion*

Alum—70% and 72.7% of the control
Alum-phosphate 78.8% and 86% of the control.
(Hammett Rec. 2563-4573; Dingwall, Rec. 4615; Resp. Exs. 347-355).

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* *Correct spelling is "Heilbrunn."—R. B. P. Co.*
† *Read "sodium acid sulphate."—R. B. P. Co.*

**Harry Gideon Wells, Professor of Pathology, University of Chicago. Member of Faculty since 1901. Director of Medical Research, Sprague Memorial Institute, Chicago.**

Testifies to the importance of the studies of plant and lower forms of animal life in order to obtain exact information concerning disease. Results obtained from study of even single cell and tissues may and have been transferred to problems in the human body and constitute practically the basis of modern medicine.

**Action of aluminum compounds on protoplasm**

Classifies aluminum compounds as protoplasmic poisons. The fundamental element of all cells is protoplasm which in its essential characteristics and behavior is similar in all living forms. I base this opinion upon knowledge of the literature, reports of investigators, observation of experiments upon evidence in the literature concerning the effect of alum compounds upon men, upon testimony of scientific investigators given before this Board and upon my own observations without exception, as far as I have been able to find, these investigators have all observed that the effect of these compounds upon the living cells was deleterious even when the aluminum compounds were present in remarkably small quantities. The growth of algae is either prevented or checked. Bacteria was found to be inhibited or checked. Animal forms, such as the egg of the sea urchin, has been reported to be affected so that the cells which have been fertilized can not continue to multiply or when aluminum is applied before fertilization is attempted, fertilization will not take place.

**—on living cells**

Whenever the living cells of the lower animal or plants come in contact with aluminum compounds, those cells are injured or killed, depending upon the concentration.

There are cases reported in the literature of death following the taking of 30 grams, approximately one ounce, of aluminum* in solution. The use of aluminum compounds in surgery has been abandoned largely because of the injurious effect upon human tissues. The administration of soluble compounds of alum by mouth is followed by evidence of irri-

** Correct reading is "alum."—R. B. P. Co.*

tation to the gastro intestinal tract. Daily doses of aluminum salts in quantities of 20 to 28 miligrams per day to dogs, cats, and other animals leads to inflammation of the lining of the digestive tract, especially the intestines. When injected into the tissue so that it comes in contact with living cells, it is found to be a virulent poison. Aluminum has been found to produce injury, especially to the kidney; in the observations of physicians, aluminum compounds taken by men not only produce injury to the digestive tract, but injury to the nervous tissue.

**—action after injection**

Aluminum compounds, if in solution, may pass into the blood stream by diffusion through the cells of the digestive tract. This diffusion may take place in any part of the digestive tract from the lips to the anus so that the whole of the digestive tract may be affected. They may pass into the blood along with fats. The moment an aluminum compound has passed through or into the wall of the intestine beyond the surface and entered the blood vessels of the intestinal wall, it will come in contact with the red corpuscles and cause those corpuscles to aggregate or clump and have opportunity to produce this injurious effect exactly the same as if the aluminum compound had been injected into the blood directly. The tendency to aggregate is a serious matter since the aggregated corpuscles cannot pass through the capillaries of the body, and tends to clog them up. Experiments have shown that when metallic substances act upon red corpuscles to produce such changes in the corpuscles, the corpuscles become more fragile, break up more readily and lead to anemia or the reduction in the number of red corpuscles in the blood.

**Action upon red blood cells**

It is possible for all the poison that is taken by mouth to be recovered in the discharges from the bowel and yet produce evidence of poison in remote parts of the body.

Aluminum compounds, being protoplasmic poisons, will poison the endothelial* of the digestive tract (these are the cells which line the digestive tract and come in immediate contact with food and drink). They not only have the function of lining the tract, but a very important function in protecting the rest of the body. Poisons of great potency

**Action on cells lining the digestive tract**

* *Should read "endothelial cells."—R. B. P. Co.*

might enter the digestive tract in large quantities and be prevented from causing any harm to remote tissues as long as these endothelial* are uninjured, but if injured, this defense is lost.

It is my opinion that the primary result of the introduction into the digestive tract of aluminum compounds would impair the protective lining of the intestine and thereafter the effects upon the other cell growth of the body, including the blood cells, would be cumulative. It is the general characteristic of metal poisons that their effect is cumulative.

**Discussion of cumulative poisons**

Now with these cumulative poisons, the effects fail of repetition frequently because they have to some extent impaired the functions of the body.† Its resistance to other unrelated injury is reduced and consequently they suffer more from these injuries than an otherwise normal person would, and the damage is attributed to this new cause which has nothing to do with their chronic metallic poison.‡

These results may occur because of large doses but they may come from small doses of aluminum compounds administered over a considerable period. A small quantity acting for a long time may produce results quite as marked as a larger quantity acting for a shorter space of time.

The resistance of the intestinal wall to bacteria would be reduced and they would get a foothold and begin to grow there when they could not do so in a normal intestinal wall.

There are two effects to be observed at the introduction into the human digestive tract of aluminum compounds, the direct effect of carrying the substance into the circulation, and an indirect effect in the intestine and in the arterial tract rendering the human organism more susceptible to disease.

**Action upon reproductive organs**

In my opinion, the effect of aluminum compounds, the passing into human system by absorption would make themselves felt in the reproductive organs. The cells of these organs are particularly sensitive to the action of any poison-

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* *Should read "endothelial cells."—R. B. P. Co.*

† *Record reads "effects fail of recognition because when they have to some extent impaired the functions of the body, its resistance, etc."—R. B. P. Co.*

‡ *Probably intended for "with chronic metallic poisoning."—R. B. P. Co.*

ous substance and often show marked changes when changes in other parts of the body are undiscoverable even by careful microscopic studies.

My opinion is that aluminum compounds are poisonous to all forms of life, including the higher animals. (Rec. 2846-2878).

**Dr. Wells' conclusion**

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*The following testimony introduced to establish the harmlessness of aluminum compounds, appears in the record:*

Dr. C. W. Edmunds (Rec. 3179) Professor of University of Michigan Medical School.

Investigated the scientific literature bearing on the question of whether the use of aluminum cooking vessels was deleterious to health. From this literature he made a compilation which was admitted as Commission's Exhibit 256 and he concludes from such study of the literature that the literature is overwhelmingly in favor of aluminum cooking vessels being harmless to health.

**Dr. Edmunds' compilation**

Dr. E. E. Smith testifies as to citations from Langworthy & Austin, Myers and Voegtlin, showing the presence of aluminum in natural foods such as corn, beans, sweet potatoes, peas, carrots.

**Aluminum in natural foods**

Clifton Evans (Rec. 3265). Captain of the Guard and Warden of the Penitentiary, Little Rock, Ark., and Paul L. Mahoney (Rec. 3233) Physician, Arkansas State Penitentiary, testifies as to the general fine health of the three colored and three white men who partook of the regular penitentiary diet in which they received food prepared with alum phosphate baking powder about twice daily, corn bread for lunch and biscuits for supper, and testified that they lived under regular habits, regular sleeping, regular eating, good food and regular routine work which has a tendency to keep them in good physical condition. Has never seen a case of anemia though he has been working in connection with the inmates of the penitentiary for five or six years. Never had any complaint from these men (referring to the eight subjects) as to stomach trouble.

**Health of prisoners fed on alum phosphate breads**

Dr. H. A. McGuigan (Rec. 3570).

**Opinion of Dr. McGuigan**

"There is no evidence whatsoever to show that they are poisonous or of any poisonous properties when given by mouth and no evidence in the literature or record in this case shows that they are deleterious to health."

**This statement might carry weight with one who had not heard or read the evidence, but to such a one it must appear to be a statement either made with reckless disregard of the evidence in the record, or made without knowledge of the record. It can at best only be regarded as a method of stating that in the opinion of the witness, alum as used in baking powder is not poisonous.**

"It has never been proven that aluminum salts are poisonous, (that aluminum salts are poisonous) except in very large doses, so large that they would not be encountered in any ordinary work." **(Rec. 3558).**

**The witness' statements upon cross examination were irreconcilably in conflict. In his own textbooks, written by him and which he endorses as still being his views, he says:***

**Summary from text books by McGuigan**

"Aluminum is classed with the heavy metals which exert their action in the form of soluble salts in two ways,

(a) *Local action,* due to combinations with proteins which classify aluminum,

With ferric chloride as styptic

To the salts of lead, bismuth, zinc and mercury as astringent.

(b) *General action,* as absorption in which there is little difference in the metals. Local absorption exerting a constricting action on the local vessels.

"When taken internally, the action is due to chemical local action on the stomach and intestine—the acid liberated upon the unit† of metal and protein penetrating to the tissue with

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* *Quoted portion comprises paraphrase by the Examiner of the substance of statements found in the text books.—R. B. P. Co.*

† *Correct reading is "union."—R. B. P. Co.*

an astringent effect. The local reactions are loss of appetite, pain and discomfort, nausea, vomiting, purging, congestion, hemorrhages resulting from irritant and corrosive action, ulcers, may result from bacterial action on dead tissue."* (Rec. 3678-3684).

**Opinions of Dr. E. E. Smith**

**Dr. Ernest E. Smith, Specialist in Research on Nutrition,** criticized the want of protein in the food given to the rats in the Geis experiments. He advanced the opinion that the rats had deficient nutrition on that account. Claimed an excessive amount of baking powder was used in the preparation of the food, that it might have given rise to a bitter taste.

**Speaking of the amount of aluminum claimed to have been absorbed in the experiments of Dr. Balls, says,**

"The body is perfectly capable of taking care of it and aluminum is not a cumulative substance in the body; it does not accumulate. If there are traces there, it is readily passed off and is not in a condition where it will do any injury as far as we have been able to learn."

* * *

**—inert nature of aluminum**

This inert nature of aluminum, while not in itself a guarantee of harmlessness, is nevertheless so far as it goes, a factor of safety to the body.

* * *

The aluminum hydroxide is comparatively inert. Aluminum hydroxide, the residue from straight SAS baking powder, so far as it goes into solution in the stomach, does tend doubtless to combine with the food phosphates and proteins. However, the very fact that such combination is of a protective nature, since when so combined the aluminum is already inert and can exert no irritating action, as to whether the aluminum protein compounds remain in solution or are at once precipitated, opinions differ. There is reason to believe that excess of protein tends to hold such compounds in solution, at least to a certain extent.

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* *Quoted portion comprises paraphrase by the Examiner of the substance of statements found in the text books.—R. B. P. Co.*

I found in my experiments where I investigated the gastric juice, that there was a greater acidity. I would not say I concluded that it was due to the residue of the baking powder.

I thought I observed that there was a slight, though uniform, increase in acidity caused by the baking powder residue as distinguished from the control.

If aluminum is injected into the blood, it is quite possible that the aluminum will be taken up by the cells. It is quite possible that the aluminum would get into the cells even though it formed a compound with the protein matter of the serum. In my opinion, the circulation of the aluminum would follow the route of the circulation of iron, and I would expect the body to handle the traces of aluminum precisely as it handles the same amounts of iron that are absorbed and used by it by making use of the same protection against any untoward action of aluminum as it makes against any untoward action of iron.

**Aluminum would circulate like iron**

So far as I have been able to form any opinion, it is my opinion that aluminum compounds as ordinarily eaten in food are not absorbed, with the reservation that it is quite possible that in forced feeding of aluminum compounds there may be a slight absorption. I mean in considerable excess of the amounts that would be taken under ordinary conditions. Yet I am not sure and I do not think that it has been proved that irrespective of the occurrence of aluminum in baking powder residues, there is not some absorbed and distributed in the human body as a normal process. I do not think the direct evidence on that is conclusive but so far as we are able to demonstrate, aluminum seems to me (on the evidence so far at hand)—aluminum absorption is an exceptional occurrence, and that the reason for its occurrence, if it does occur at all, is due to the ingestion of excessive amounts of aluminum salts."

**Rat experiments of Dr. E. E. Smith**

After the Geis experiments, Dr. Smith conducted some experiments in feeding rats, using a diet which included aluminized food. Concerning this experiment there is voluminous testimony, but as the experimenter in the reports of

his experiments used a standard for measuring growth different from the standard used by all other experimenters, and used a different standard in reporting the different groups, it has been found impossible to give a detailed presentation of this experiment. However, I think it may be fairly stated that the result of the experiment showed that the rats fed upon a food containing alum baking powder showed a definite and uniform lower rate of growth than the rats in the control groups, but it is also thought that it is a fair inference from Dr. Smith's testimony that he himself drew the conclusion from his experiment that the alum rats showed no illness or diarrhea and that he found nothing in his experiment which would indicate toxic action of the aluminum residues from the baking powder.

**Testimony of Dr. Chittenden**

Dr. Russell H. Chittenden, Director, Sheffield Scientific School of Yale. Professor Emeritus of Physiological Chemistry, Yale. Director and Lecturer, Department of Physiological Chemistry, Columbia University, 1898-1903. Studied abroad. American Academy of Science, American Physiological Society. American Society of Biological Chemistry and many other societies.

Was a member of the Committee which served, War Department, in investigating the so-called Embalmed Beef Inquiry after the Spanish-American War. During the World War represented the United States on the Interallied Scientific Food Commission of France, Italy and Great Britain. Member of the Referee Board of Consulting Scientists appointed to such board by President Roosevelt in 1908. This board was in active service from 1908 to 1914.

Witness describes his connection with the Remsen Board.

I should not think that small fraction of a miligram or even a miligram, if actually present in the blood, would have any real significance even if experiments did indicate minute traces of aluminum in the blood, I should not consider that in itself would indicate any deleterious effect. If, however, they are combined with other results, then they might put the two together and such a result would be significant.

Aluminum so far as we know, is not a necessary constituent of the human body, while iron is.

Not everything that is soluble is absorbed, so that the mere fact of a substance being in solution does not necessarily mean that it will be absorbed in the gastro-intestinal tract.

I should like to have on the record a clear statement as to my position with regard to alum or alum solution and I have taken the statement from Dr. Cushny's Book on Pharmacology and Therapeutics, the 8th Edition, 1924, page 670. Professor Cushny is the professor of Pharmacology in the University of Edinburg and is one of the foremost on the subject of pharmacology and therapeutics and the statements I want to read express practically my own opinion with regard to the action of alum in alum solutions as distinguished from residues in baking powder.

"Alum solutions have a substantial* astringent taste and in small quantities induce no symptoms except as* dryness to the mouth and throat. Larger doses act as gastric irritants and cause nausea and vomiting and in extreme cases, poisoning.*

"Even the larger* quantities, however, are followed by no symptoms except those of gastric intestinal irritation and inflammation and the long continued use of alum does not elicit any symptoms of chronic poison.*

"The aluminum salts are only absorbed in small quantities from the stomach and intestines so that no symptom of intestinal* poisoning arises from the internal use of salt."*

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* *This quotation was badly mutilated by the stenographer, corrected, it reads: "Alum solutions have a sweetish, astringent taste, and in small quantities induce no symptoms except a feeling of dryness and astringency of the mouth and throat, and some constipation. Larger doses act as gastric irritants and cause nausea and vomiting, and, in extreme cases, purging. Even the largest quantities, however, are followed by no symptoms except those of gastro-intestinal irritation and inflammation, and the long-continued use of alum does not elicit any symptoms of chronic poisoning. The aluminum salts are only absorbed in small quantity from the stomach and intestine, so that no symptoms of general poisoning arise from the internal use of the salt."—R. B. P. Co.*

Now this summarization of Dr. Cushny is perfectly accurate and well defined statement with our knowledge in regard to this matter—the reaction of alum—and it fits in perfectly with my own views as the result of my own experience and experiments so that I would like to have it on the record.

I think very likely that large quantities of much* soluble alum compounds such as potassium aluminum sulphate in sufficient doses you might have inflammation but I have never seen it.

I have never known of a death from aluminum poisoning. At least, I do not recall any. There may have been some such cases. I think it is pretty generally understood that cases of so-called poison by aluminum are very uncommon,—very rare indeed. I do not know of a single case myself. I cannot recall a single case in literature.

Now, of course, you can consider the introduction of very large doses of aluminum, you may consider it possible to have that fatal result. There is no question at all about the injurious action of very large doses of aluminum introduced directly into the circulation or introduced directly into the gastro-intestinal tract.

Q. Aside from all extreme cases, taking the ordinary case, is it not quite certain that free hydrochloric acid would have an opportunity to act upon any aluminum compound in the stomach?

A. I think so, decidedly, sooner or later.

Q. So that at least in many cases you would expect that aluminum compounds in the stomach would be acted upon by free hydrochloric acid?

A. I should, most decidedly.

Q. And if they were, what would you expect to be the result in the case of these residues from baking powder?

A. That they would pass into solution in some degree.

*Probably intended for "with large quantities of soluble alum compounds."—R. B. P. Co.*

Q. And would you expect that one of the results would be the formation of aluminum chloride?

A. It would be possible. . . . of course, it is very difficult to say "yes" and "no" to some of these questions, but that is quite a possibility, indeed a probability.

Q. You think it is probable at any rate that the residue or residues from alum baking powder baked in bread would comprise aluminum compounds soluble in hydrochloric acid?

**Summary of Chittenden's evidence**

A. More or less soluble in hydrochloric acid. (Rec. 3865-4093).

A fair summary of this witness' evidence appears to be that the witness has never seen evidence which convinces him that aluminum compounds as ingested in baking powders, are harmful.

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**Conclusions of Trial Examiner**

In the instant case, one set of men standing high in their professions, detail the experiments they have conducted, state the conclusions that they have reached, and under oath state their opinion—That aluminum compounds as used in baking powders are harmful to health.

Another set of men of equally high professional repute also under oath, state—We have not seen evidence which convinces us that aluminum compounds as used in baking powders will be injurious to health.

It may be that, until science has advanced farther, it will not be possible to establish beyond a reasonable doubt whether aluminum compounds as used in baking powders are harmful or are harmless.

The evidence in this record does not prove that they are harmless.

The evidence in this record does prove that there are substantial grounds upon which to predicate an honest opinion that they are harmful.

## IX.

**Specification Three of Paragraph Three of the complaint charges, that by direct written and oral statements the respondent has falsely represented substantially as follows:**

**Specification Three of complaint**

(a) That competitors' powders are poisonous;

(b) That competitors' powders are made from ground-up aluminum cooking utensils;

(c) That competitors' powders do not come within the Pure Food Laws;

(d) That competitors' powders pucker up the stomach in the same manner that lump alum puckers the mouth;

(e) That competitors' powders are made of the same substance which is used for styptic purposes after shaving.

**The following are the statements shown by the evidence to have been made by the respondent since 1914:**

**Respondent's statements since 1914**

1914. The Pure Food Laws have helped to inform the public by requiring that the ingredients be printed on the label. The composition, therefore, now appears on each package, though often in small type and in an obscure place. But the information is there and can be and ought to be obtained by every user of baking powder.

Read the ingredient clause on the baking powder you are using, and buy only the kind that you believe to be the most wholesome.

1919. Contains no alum—Leaves no bitter taste. Alum in food has been condemned by many medical authorities—England and France forbid it. **(Com. Ex. 78).**

**In a pamphlet entitled "Why Westfield Objects to Aluminum in Food Products" (Com. Ex. 234) which was a reprint from the Hartford, Conn. Times of February 25, 1915, and which pamphlet set forth the views of the Board of Health of the Town of Westfield, Mass., which it appears was a town styling itself "The Pure Food Town," and which pamphlet was printed by the respondent and distributed by the respond-**

**Westfield circular**

ent in connection with the Royal Cook Books. The pamphlet was not anonymous and in this pamphlet there appears the following language:

> "Westfield objects to the use of alum in all food products whether baking powder, pickles or condiments for the following reasons: This poisonous, irritating astringent drug is either directly injurious or it may split up into objectionable compounds."

**Royal Cook Book**

1920. The Royal Cook Book, copyrighted 1920 and widely distributed, contains no reference to alum except the statement: "CONTAINS NO ALUM—LEAVES NO BITTER TASTE." (Com. Ex. 234).

**"A Collation of Cakes"**

1923. In a booklet entitled "A Collation of Cakes" by Claudia Quigley Murphy, printed in 1923, a book intended to be used in the classroom for the teaching of culinary art as well as in home demonstration work, a book gotten out by Mrs. Murphy, but paid for by the Royal, who assisted in the distribution of the book, under the heading "What Chemistry has Contributed to Cake Making" the writer quotes from many authors, giving in each instance the author from which she is quoting and the work from which the quotation is taken, and among these appeared the following statements:

> "Alum baking powders contain sulphuric acid in aluminized* sulphates. These are considered harmful by physiological scientists; they hinder digestion by acting as an astringent as does a substance commonly known as 'alum.' Alum touched to the tongue puckers the mouth. Alum baking powder residues taken in food act similarly upon the digestive tract." (Edith Greer, Boston, Mass., 1915).

The above statements are all of the statements proven to have been published by or with the consent of the respondent in which there appears any statements at all comparable

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* *Correct reading is "alkali sulphates."—R. B. P. Co.*

**with the statements alleged to have been made in Specification Three of Paragraph Three of the complaint as set forth above.**

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***The evidence shows the following statements to have been made by Demonstrators***

**Statements by Royal demonstrators**

November, 1922. "Well, of course Royal is made from fruit acid ingredients, whereas Calumet and practically all the other powders are made from mineral ingredients that come out of the ground. The ingredients they are using is called 'alum'." **(Rec. 122).**

"Do you mean to tell me that they put in this baking powder the same stuff that I put on my face after shaving?"

"Yes, it is exactly the same thing. See these pans and things up here (pointing to cooking utensils)? They are made from the same substance, the same alum acid." **(Rec. 123).**

She showed me alum and told me that that was what was used in Davis; that it was ground up aluminum, the same stuff that I had for my pots and pans for my kitchen. **(Rec. 131).**

February, 1921. You know when a man shaves and cuts his face he uses alum. You know that alum would shrink the nerves of the stomach. **(Rec. 345-350).**

1921. Told her that alum was poisonous, that it was an astringent that would contract the muscles and was given only in severe cases like painters' colic, or to, say, some of the larger animals, such as elephants. **(Rec. 400-403).**

1921. Said that the barber used alum on cuts to dry up the blood; and she told about the woman who had a child with an ulcerated stomach and the Doctor claimed it was from baking powders she had been using. **(Rec. 442-4).**

She said it was an astringent and was very injurious to the stomach. **(Rec. 442-4).**

Respondent's instructions were to say that alum was made from the same substance as aluminum cooking utensils.

This statement is literally true and is used by the Department of Agriculture in its Bulletin No. 103 (Com. Ex. 250) in which the following language appears:

> "Aluminum is a synonym for aluminium, the metal used for cooking utensils and other implements, alum or sodium aluminum sulphate is a salt of this metal."

**Conclusions of Trial Examiner**

In weighing the evidence as to the statements made by the demonstrators, it must be borne in mind that most of the witnesses were testifying at least two years after the time when the statements were alleged to have been made.

Many of the statements set out in this paragraph are literally true, others are clearly figurative, others are expressions of opinion.

## X.

**The Royal slogan**

In the advertising of the respondent, since 1914, constant and frequent use is made of the words, "CONTAINS NO ALUM—LEAVES NO BITTER TASTE." These phrases are used only of and concerning its own powder.

There is no specific charge in the complaint relative to the use of these words but as considerable testimony has been given, it seems proper that reference should be made to it in this report.

That certain competitors' powders do contain alum has been proven, that respondent's powder does not contain alum is admitted; therefore, the statement "Contains no alum" is literally true and as its competitors' powders do contain alum, cannot even by inference be held to be a "*false* statement that its competitors' powders contain alum."

"LEAVES NO BITTER TASTE." There is no proof that Royal baking powder leaves a bitter taste. We therefore must find that there is no evidence that this statement is false.

If, however, it can be construed that the complaint charges that the statement made of and concerning its own powder "leaves no bitter taste," inferentially means that its competitors' powders containing alum leave a bitter taste, and that such statement is false; then it becomes necessary to consider whether baking powders containing alum do in fact leave a bitter taste.

**Bitter-Taste Experiments**

Elaborate tests were made by Dr. Robert L. Emerson, Research Chemist, Cambridge, Mass. (Rec. 1963); Dr. Samuel C. Prescott, Head of the Department of Biology and Public Health, Massachusetts Institute of Technology (Rec. 1941) and Ula M. Dow, Teacher, Foods and Household Management, Department of Home Economics, Simmons College, Cambridge, Mass. (Rec. 1923) to determine the question of the bitter taste, if any, in breadstuffs, made with tartrate and alum baking powders. A number of tasting experiments were run, the result of which proves that at least to a majority of the palates of the tasters, there was a bitter taste in the breadstuffs made with a straight alum powder.

Benjamin H. Jacobs, Chemist, Washington, D. C. (Rec. 3947) conducted a series of tasting experiments using a straight alum baking powder and Royal. His four tasters reported the biscuits all tasted alike to them. Nothing abnormal or metallic about them.

**Conclusion of Trial Examiner**

The fact is that whether there is or is not a discernible bitter taste in a biscuit made with straight alum powder depends upon the quantity of baking powder used in proportion to the amount of flour, upon whether made with milk or made with water, upon the character and quality of the shortening used, and upon the conditions of oven temperature. Carelessly made, the biscuits will leave a bitter taste; carefully made, and if eaten hot, they will not leave such a taste.

## XI.

**Charge of anonymous advertising**

Paragraph Four of the complaint, in effect charges that the respondent published, or caused to be published, and distributed expressions, opinions and comments which seemed to be either anonymous or the voluntary contribution of disinterested qualified authorities.

The only evidence in the record is the book called "A Collation of Cakes" (Com. Ex. 249) written by Claudia Quigley Murphy and it appears from the evidence that Mrs. Murphy prepared the outline of her book and offered it to the Calumet Baking Powder Company, but they could not agree on price. She later offered the book to the Royal and they agreed to pay for her services and for the publication of the book. The first edition of the book was distributed by Mrs. Murphy, assisted by the Royal, and that edition did not contain any statement showing that the Royal Baking Powder Company had any interest whatever in the publication. Later editions, however, did contain an endorsement by the Royal.

**Conclusion of Trial Examiner**

I have already quoted from the book. This being the only case shown by the evidence, it cannot be held that "the respondent put into practice, operating on an extensive scale and carrying into effect vigorously throughout a wide area of population," the plan as charged in Paragraph Four. De minimis non curat lex.*

Respectfully submitted,

Edward M. Averill

*Trial Examiner.*

November 12, 1925.

* *"The law does not concern itself about very small matters."—Standard Dictionary.* (1906)

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