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PAINT, OIL AND CHEMICAL Review

Formerly PAINT, OIL & DRUG REVIEW Established 1883

For thirty-seven years the only weekly journal in America devoted exclusively to the
Paint and Varnish Industries.

O. McQ. HOWARD,
President

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CHICAGO, JULY 7, 1920

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Time Brings Changes

IT is with pleasure that THE REVIEW greets its friends this week in a new guise and under a new name. The change is one which has been made after long and careful consideration and for reasons which we believe will commend themselves to our readers as being for their best interests as well as our own—as our interests are of course mutual in every sense. The new name, PAINT, OIL AND CHEMICAL REVIEW, correctly if not completely describes our field of endeavor, eliminating the word "drug" which had long been a misnomer, except as the drug trade have been handlers of paints, oils and chemicals, and which had led to frequent misunderstandings and mistakes.

On the other hand the substitution of the word "chemical" formally recognizes the advent of a great new element in the commercial life of our country, the growth of a new industry closely allied to the paint, varnish, color and pigment industries, and the demand among our subscribers for more information and more complete handling of the new problems and possibilities thus developed. Our Chemists' Forum has indicated our recognition of this need for the past year and the cordial welcome and steady growth in support accorded that department has already more than justified the change in

name, in advance.

Furthermore the use of the three words paint, oil, and drug by three leading publications in different sequence was confusing both to the trade and the general public. Therefore while any change in an old and valued friend is apt to be looked upon with regret by the conservative mind, still it must be admitted that change is one of the laws of progress. "The times change and we change with them" and a publication like ours must always be in the foremost of the march of progress.

As to our change of form to a "standard" 9x12 size, this too is in the line of "standardization" which we believe in thoroughly as in accord with the best modern methods. It has many practical advantages which our advertisers will be quick to recognize and which will enable us to give our readers better all round service.

We shall hope to receive the congratulations of our subscribers and are always open to suggestions for further improvement. Finally we wish to say that the changes are entirely external and do not extend to our personnel. While there have been some additions and improvements in our staff the control of the paper is exactly as it was in February, 1914, when the present owners purchased the property.

Mistakes of Lacquer Makers

LACQUER made from nitro-cellulose is not a new product in one sense because it was made back in the last century but in its present principal type and the uses to which that type is adopted it's in its infancy. Along with other growing infants it has its infantile diseases, growing pains and what not!

The public brought up on paint traditions try to apply them to lacquer and find themselves much at sea. Evaporation against chemical drying, solvents which destroy old painted surfaces, mixing of colors which used to produce certain other colors but fail entirely with lacquer, are examples of the kind of troubles which bother and bewilder the buying public and even the painter himself. Ignorance on the part of manufacturer, salesman and user are bound to lead to errors and misunderstandings. But make no mistake, lacquer is here to stay, and we will learn to adapt ourselves to it and use it. Don't be

discouraged over individual failures and mistakes. Learn all you can and put your knowledge to practical use.

A case in point is the failure in the new lacquers of many attempts to make good lacquer from solutions of old films and similar used materials. Comparatively inexperienced makers are still using these products and the public are finding that this class of lacquers does not hold up. The unfortunate result is a prejudice on the part of the public against all lacquers—whereas the fault is only in this type. The lacquer made from new nitrated cotton is as lasting as any pigment ever made. Some day we may learn to make as good from old pyroxylin films but we doubt it.

At present in the interests of the public and for the good of the industry we advise our readers to play safe. Buy the best material obtainable. Educate your customers in the use of the new protective coating and study their needs as to the exact type of pyroxylin compound they need and you will be working constructively both for yourself and the whole industry.

A New Paint Theory

IN THIS ISSUE appears an address made by Mr. John R. MacGregor of the Eagle-Picher Lead Co., which presents a totally new idea of the paint subject. It has always been understood that linseed oil was the life of paint. Advertising campaigns have been based on this theory and the dealer has used it as a selling argument for many years past. In the paper read by Mr. MacGregor before the Pennsylvania State Convention of Master House Painters and Decorators, in January, he upsets all the old theories and advances proof that "paint" is the element which protects the wood and it is the linseed oil in the paint which is destroyed--therefore the less linseed oil used to form a good film the longer the paint will wear.

Of course it is a well-known fact that linseed oil alone, when painted on a board and exposed to the elements, will soon pass away and fail to protect. Mr. MacGregor also shows that you can't get maximum spread and maximum thickness out of any one gallon of paint, for when you brush out a paint over an excessive area the life of that paint is proportionately decreased. The theory advanced is that the paint which carries a minimum amount of linseed oil and a maximum amount of pigment will give better service for out-

side wear. Therefore a paint should contain other vehicles than linseed oil, which should be vehicles to help spread the paint and at the same time when the paint has been applied to the surface will evaporate, leaving the paint applied with the minimum amount of oil necessary to form a good film.

Mr. MacGregor takes up the subject of cracking, chalking, peeling and other interesting phases of the paint subject in such a manner that many of the old, well-known theories have been upset.

The discussion which followed the reading of Mr. MacGregor's paper is most interesting and we are informed that as yet no one has come forward and offered any denial of the facts quoted by him, and in view of the fact that he seems to have substantiated his statements, his paper offers an opportunity for scientific study along lines which are totally new and well worth considering.

Unlike many papers read by white lead men, Mr. MacGregor does not in this one boost his own product to the disadvantage of another. He treats the subject of paint in a broad and thoroughly scientific manner, whether he is right or wrong.

The Great Aniline Merger

THE need of an actual offensive and defensive alliance of chemical interests, to meet German and any other competition after the war, is so absolute that the recent merger of some of the largest dyestuff concerns in the United States in a twenty million dollar combination seems almost a matter of course.

The name chosen for the new gigantic consolidation is that of one of the moving powers in the reorganization, namely the National Aniline & Chemical Co., of which Mr. I. Frank Stone is president.

The name National truly expresses the scope of the great project. The companies which will be combined include the Schoellkopf Aniline & Chemical Works, of Buffalo; the W. Beckers Aniline & Chemical Works, of Brooklyn; Benzol Products Co., of Marcus Hook, Pa., and the departments of the General Chemical Co., and Barrett Co., which have produced crudes and intermediates. This will give the new organization control of production from the outset so that they will be independent of all other interests, from raw material to finished product. On the

other hand while they will be the strongest individual factor in the business with a capital of twenty millions and while the new company will have among its officials such leaders in the industry as the two brothers J. F. Schoellkopf and C. P. H. Schoellkopf, Dr. Wm. Beckers and I. Frank Stone, there are thirty odd competing plants in the country already and new ones are springing up every day so that it will be anything but a monopoly and still the efficiency of the great organization is apparent. They will produce many chemical products besides dyes, including explosives, acids, coal tar distillates, pharmaceutical preparations, and supplies for the electrical, photographic and many other industries.

This is probably only the first of several great consolidations of this character which will put the color and chemical industries in America on a par with their rivals on the Rhine, provided always they can have the intelligent co-operation of the government, which is so essential. The result should be of great advantage to the paint trade and all the allied industries.

Motor Cars and the Paint Business

THE paint trade is gradually beginning to appreciate the great advantage of the motor driven vehicle. Both trucks and medium weight delivery wagons are coming into general use and the speed and convenience afforded as compared with horse-drawn vehicles, make it only a question of time when practically all the heavy hauling as well as the delivery work will be handled in this way. In this respect the paint industry has not responded as promptly as some others but the idea is at work and wherever two or three manufacturers, jobbers or dealers get together now-a-days the question of motor trucks is very apt to be under discussion.

Any man who owns a pleasure car, and there are thousands of them in the trade, is already half converted to the truck idea.

No other industry has ever enjoyed a growth so amazing as has the manufacture of vehicles that run by their own power. This year is the twentieth anniversary of the motor vehicle's birth. Throughout these two decades the advancement in the industry has been progressively astonishing, from the day of the "one-lunger," as the single cylinder machine was termed, to the present time, when the

experts can discuss the relative merits of eight and twelve cylinder engines.

With good reason the industry is now classed as one of the greatest in the United States. Last year some 892,000 motor vehicles were sold in this country. The estimated production for the current year is 1,200,000. The retail value of the cars sold last year, including the trucks, was \$691,000,000, of which the passenger cars were valued at \$565,000,000.

These totals afford a measure of the volume of the business and another measure is found in the by-products. For example, automobiles are credited with having consumed last year in this country 980,000,000 gallons of gasoline and nearly 29,000,000 gallons of lubricating oil and approximately 12,000,000 tires are used each year.

That the motor vehicle is rapidly becoming the universal means of getting persons and things from place to place is indicated by the fact that the proportion of such vehicles to the population of the country is as one to forty-eight, while Iowa, with its registration of 117,407 cars, has one car for every nineteen persons, thus standing first.

LT. WELLS MARTIN RETURNS.

Lt. Wells Martin of the Martin-Senour Co., has returned to Chicago after receiving his honorable discharge from the Army. Since last April Lt. Martin has been working in the Bureau of Aeroplane Construction specializing on "dope" or chemical varnish for aeroplane wings, an assignment which was given him because of his experience in the varnish industry. Lt. Martin returns to the trade as General Manager of the Martin Varnish Co. and is receiving the congratulations of his friends on his record in the service and his well earned promotion.

OBITUARY.

William Elmendorf.

Willard Elmendorf, president of the Elmendorf Varnish Company of this city, was killed Monday evening, Dec. 25, when he was struck by an automobile. Mr. Elmendorf, who lived at 3708 North Racine Ave., was returning home from his office and was crossing the street after getting off a street car when he was run down, one wheel of the auto passing over his body. The driver immediately stopped and assisted by those who witnessed the accident placed Mr. Elmendorf in the car and started for a hospital, but he passed away before reaching there.

Born in Chicago January 7, 1860, the son of William Alexander and Sarah Billings Elmendorf, he grew to manhood in the city of his birth. On his graduation from high school he entered the employ of the Elmendorf Varnish Company established by his father in 1872.

For a number of years he successfully represented the company on the road and was admitted to partnership in the firm in 1899, succeeding to the presidency of the company on the death of his father in 1911. Mr. Elmendorf was a master of the technique of varnish making, having made this work his life's study.

GLIDDEN CO. BUYS WHITTIER COBURN.

THE purchase of the Whittier Coburn Co. of San Francisco by the Glidden Varnish Co. for a consideration said to be in the neighborhood of \$300,000 is one of the interesting developments of the past week.

Alexander Selater, formerly vice-president of the Union Oil Company at Los Angeles up to March 1, has been made a vice-president of the Glidden Co. and will be general manager of the San Francisco house.

It is said that Messrs. W. B. Weir, president of Whittier-Coburn, and W. J. Weatherley, secretary, are to retire from the business.

NEW WHITE PIGMENT.

The records of the U. S. Patent Office call attention to the growing importance of titanium oxide as a new white pigment. U. S. Patent No. 1,317,165 is described as a white pigment suitable for use in paints made by treating compounds of titanium containing iron and sulphurous oxide with sulphuric acid in the presence of zinc sulphate. The resulting mixture is heated with NaCl to temperature from 300 to 700 degrees or sufficient to effect the decomposition of the mass and the formation of titanium oxide and zinc oxide. The soluble substances are then washed out.

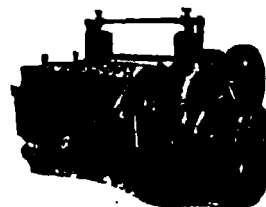
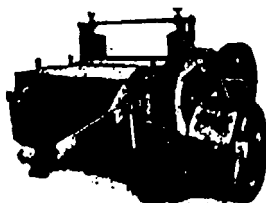
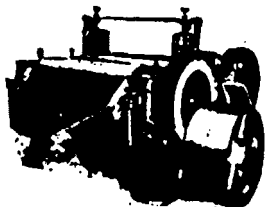
In patent No. 1,317,164 to the titanium oxide is added water or hydration 95 parts, zinc oxide 5 parts and treated with 2.5% H₃PO₄.

I. W. W. IN THE PAINT TRADE.

George Manos, discharged as shipping clerk by the Midland Linseed Products Company, at 140 West Van Buren street, is alleged to have written a demand for \$2,500 and signed the letter "An I. W. W. Member." Benjamin P. Epstein, assistant district attorney, asserted Manos threatened to blow up the company's plant if the money was not left at his home, 1214 Clybourn avenue. He was arrested there and held to the federal grand jury.

Reduce Your Costs and Solve Your Labor Problems at the Same Time

One Unskilled Laborer



and THREE 12-In. Water Cooled Chilled Roll Mills will do the Work of



EIGHTEEN 36-In. Water Cooled Stone Mills

Everything but Straight Japan Colors can be ground on this Type Mill.

They Require No Dressing.

There is No Loss of Material in the Mill.

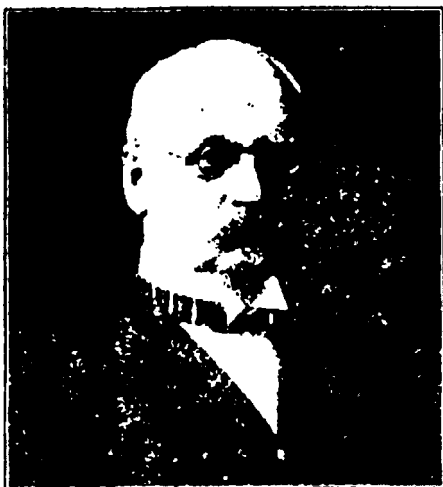
They Grind Finer. Therefore Use Less Tinting Colors.

Let Us Show what this Machine will Save in YOUR FACTORY.

THE J. H. DAY COMPANY CINCINNATI, OHIO

DEATH OF MILO S. CLAPP.

Just as we are going to press we receive the sad news of the death of M. S. Clapp, President of the Warren Paint



Milo S. Clapp.

Co., of Warren, O., after an illness of five months at the age of 71.

Every one looked on Mr. Clapp as one of the ablest as well as the most venerable figures in the paint business. A full biography will appear next week.

ZINC PREFERABLE TO LEAD.

An English publication formerly devoted to the exclusive use of lead makes the following statement:

It is a striking example of the change of opinion which comes about from a careful investigation of this important subject, the value of which is greatly accentuated by the new English restrictions in the sale and use of white lead.

"From lengthy experiment with zinc whites for exterior work, especially on greenhouses, inside and out (than which no severer test can be tried), I am personally convinced that a mixture of zinc oxide and sulphide with a percentage of barium sulphate or asbestine, if used in pure linseed oil of the best quality and care be taken as to the proper thinning of the sequence of coats, will outlast the same covering of commercial white lead in linseed oil.

"The increasingly difficult problem of an adequate supply of linseed oil of a high purity and of pale color is a far more prolific cause of the failure of zinc whites than the pigment itself, for, as I have before remarked—and the remark bears frequent reiteration—'Oil is the life of paint.'

"The cost of zinc as against lead is just now a matter for consideration. Roughly, zinc white of the quality desired

costs per cwt. half as much again as lead. On the other hand a coat of zinc will cover adequately half as much again in area of painted work, so that this more than equalizes the cost. If white lead to the value of £1 covers work to the value of £2, zinc white to the value of £1 10s. covers work to the value of £3. On the other hand, there is a distinct saving in carriage and handling, and the use of zinc white paint is a lighter job and consequently a quicker one."

NUBIAN TRANSFERS TO GLIDDEN.

The Glidden Company, in accordance with their contract, have purchased from the Nubian Paint & Varnish Company of this city, 259x320 feet at the northwest corner of Leclaire Avenue and Moffett Street; 10x320 feet, 15 feet south of the St. Paul Railway and in Moffett Street; 530x110 feet, 140 feet west of Leclaire. A total of \$118,500 was paid for the three properties. The Glidden Company announces tentative plans for improving the corner lot with an office building and the 10x320 lot in Leclaire Avenue with a four-story paint factory.

REICHARD-COULSTON COMBINE.

Of interest to the color and chemical trades was the announcement this week of a merger between the firms of J. W. Coulston & Co. and F. A. Reichard. The former is a leading factor in the importation of dry colors and the latter a large importer of colors and chemicals.

Both houses agreed to dissolve and incorporate under the name of Reichard-Coulston, Inc., beginning business the first of May, at 303 Fifth avenue, New York City, the present address of F. A. Reichard.

The incorporators of the new firm are W. I. and J. W. Coulston, of 80 Maiden lane; A. Paluel De Marmon, also of 80 Maiden Lane; and F. A. Reichard of 303 Fifth avenue. The capital is \$300,000. Sales offices will be conducted in the principal cities in the country.

The Texas Company has increased its capital stock from \$55,500,000 to \$69,375,000, making it the largest capitalized domestic corporation doing business in that state. The Texas Company has plans under consideration for greatly enlarging its facilities for refining and marketing its products.

ABOUT THE GRAYS.

Gray is gray to the average person, and yet there are many grays. Some have a cold bluish cast, a warm, red, yellow-brown or a green tone. The particular shade of gray which looks so well with certain color combinations doesn't hold its own when placed amid new color surroundings.

The tendency for years has been to simplify color formulas. For outside painting there may not be great reason to do otherwise, yet without adhering to simple formulas too closely much more beautiful tints and shades are produced. The grays made with lampblack only are crude and cold and can never equal those produced with both lampblack and raw umber.

When mixing grays for interiors it is very necessary that

Three out of every five dealers handling Horseshoe Brand Paints and Varnishes are doing a larger paint business than any other dealer in the same town.



If not already represented in your town we will be glad to explain our exclusive agency proposition. Write us about it.

Mound City Paint and Color Company

Norris B. Gross, President

Wm. H. Gross, Jr., Vice-President

E. H. Dyer, Secretary

SAINT LOUIS

Minneapolis

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they be given a tone or cast to relate them to the color most in evidence in rugs and furnishings. Colors mixed from a white base and a single tinting color do not have the life and charm of those mixed with two or three tinting colors. A gray may contain a touch of red in its composition which you cannot see as such, but it has its effect in the impression given. This fact is noticed when you try to match some fine colors. Your mix comes very near matching, yet you can see or feel that something is lacking. You don't know what color ought to be added to tone up your mix, because you cannot see it. Here are five gray formulas to keep in mind. The last two are especially fine:

1. Lampblack and white lead.
2. Raw umber and white lead.
3. Lampblack, raw umber and white lead.
4. Ivory black, a touch of medium chrome yellow and white lead.
5. Raw umber, a touch of blue and white lead.—*National Review.*

GOHEEN PLANT BURNED BY SPIES.

German spies are suspected of having caused the \$200,000 fire which completely destroyed the Goheen Manufacturing Co.'s plant at Canton, Ohio.

The plant was producing paint for the United States Navy, used mainly for submarines and for camouflaging ships.

The fire was one of the most spectacular ever seen in the city. The flames spread with rapidity. When the fire reached the basement of the plant, drums of turpentine blew up. Nobody was injured. An investigation to trace down the plotters who are believed to have caused the fire was started immediately.

PASSONNO MADE CLEVELAND MANAGER FOR BENJ. MOORE & CO.

Announcement is made of the appointment of Fred J. Passonno as general manager of the Cleveland office of Benjamin Moore & Co.

This appointment comes as a distinct advancement to Mr. Passonno, who has been connected with the Brooklyn office of the company in the capacity of salesman, to which position he was graduated a year ago in recognition of his meritorious work as salesman in eastern and southern territory. Mr. Passonno's entire business career has been spent in the paint industry, he having started as a boy in a retail store in his home city, Watervliet, N. Y. His new position as head of the Cleveland office will give Mr. Passonno ample opportunity for the display of those abilities which have made possible his remarkable progress in the paint manufacturing business.

OTTO ISENSTEIN & CO. CHANGE NAME.

Otto Isenstein & Co., importers of Varnish Gums, have announced that Mr. Otto Isenstein has by authority of the Supreme Court changed his name to O. G. Innes, and that the Corporation changed its name to Innes & Co., Inc.

There will be no change in the ownership or management, and the business will be conducted the same as heretofore.

First Sale of An Enemy Alien Bronze Powder Factory.

By consent of the United States Government and order of the Supreme Court the alien enemy bronze powder factory of B. Ullmann & Co., Inc., located at Closter, N. J., has been sold and transferred to Henry H. Mandle and M. A. Harwick, who have organized a new company under the firm name of United States Bronze Powder Works, Inc., with main offices at 220 West 42nd street, New York City.

It is a source of great satisfaction at this time to know that, while heretofore bronze powder factories have been usually foreign-owned, the new enterprise is distinctly American in management and ownership. Why should this not be so, when we have in this country the metals and all the materials needed for the most diverse and complicated processes, as well as the mechanical skill and executive ability to transform them into finished product?

DU PONT BLUES

Made in Cawky-Clark Plant

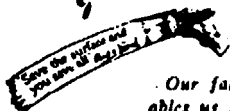
- C. P. Chinese Blue
- C. P. Milori Blue
- C. P. Bronze Blue
- C. P. Prussian Blue

These Chemically Pure Iron Blues

represent the maximum of strength, clearness of tone and dependable uniformity. They are carefully made and thoroughly washed by a Du Pont Process which ensures softness of texture.

We also manufacture

- C. P. Soluble Blue
- Bluflex Blue
- Blue Lakes
- Violet Lakes
- Purple Lakes



Our facilities and modern methods enable us to manufacture on a large scale, thus ensuring satisfactory and prompt shipments.

E. I. DU PONT DE NEMOURS & Co.

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WILMINGTON DELAWARE

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Formula Department

Formulas, Processes and Comments on Paints, Oils, and Varnishes

by Dr. W. G. Scott

(Continued from issue February 20)

CONCENTRATED VARNISH DRIER. No. 1005

Weight per gallon, 7.60 lbs.

Formula

100 lbs. H. Rosin.
5 lbs. Slaked Lime.
50 gal. V. M. Linseed Oil.
50 lbs. Manganese Dioxide.
100 lbs. Red Lead.
100 gal. Wood Turpentine.
100 gal. Naphtha 54 (benzine).

261 gal.
15 gal. Loss.

246 gal. Product.

Directions: Melt the rosin, sprinkle in the lime and run to 450° F. Hold at 450° F. for about 10 minutes, then commence adding the linseed oil in small portions.

Continue the heat so that the addition of the cold linseed oil will not solidify the rosin, then, when all the oil is in, raise the temperature to 320° F.

Pull from the fire and commence adding the black oxide of manganese, a little at a time. Stir very frequently and as soon as the temperature begins to fall, put the kettle back on the fire and again raise the heat to 320° F. (this means that in a large kettle the heat will rise to 400° F. to 425° F.), therefore aim to cook at 420° F. to 450° F. (in no event above 480° F.), until the manganese is taken up, known by a sample on glass showing a transparent amber color.

When the manganese has been taken up, begin adding the red lead in small portions, stir very frequently, whip down the foam when necessary, and aim to cook at 420° F. to 450° F. until the lead is taken up.

The cooking is completed when a tough "pill," free from tackiness is obtained. It must not be a hard brittle "pill," otherwise the japan will not mix with raw linseed oil.

When the cooking is finished, pull from the fire and then thin with the turpentine, usually at a temperature of 450° F. to 420° F. When all of the turpentine is in and the heat is down to 320° F., or lower, follow with the benzine.

B. CONCENTRATED DRIER. No. 1006

Weight per gallon, 7.19 lbs.

Formula

Formula	Percentage
120 lbs. H. Rosin	5.20
6 lbs. Slaked Lime	.26
120 lbs. Red Lead	5.20
60 lbs. Manganese Dioxide	2.60
60 gal. V. M. Linseed Oil	20.20
72 gal. Heavy Naphtha, 48° F.	20.46
168 gal. Naphtha, 54° F. (Benzine)	46.08

313 gal.
20 gal. Loss.

293 gal. Product.

Directions: Melt the rosin, sprinkle in the slaked lime and then run to 450° F. and hold for 10 minutes.

Add the cold linseed oil in small quantities, stir well and continue the heat so that the temperature will remain at about 300° F.

When all the oil is in, and the heat is up to 300° F. or 320° F. pull from the fire and commence adding the red lead, about 2 pounds at a time.

Stir constantly, and as soon as all of the lead is in, put the kettle back on the fire and heat slowly and cautiously to 330° F. Heat will probably rise to about 425° F., at which point frothing will begin; therefore stir very frequently and whip down the foam. Cook at 400° F. to 450° F. until the lead is taken up, usually in 2½ hours to 3 hours, then commence adding the manganese dioxide, about a pound at a time. If excessive frothing takes place, pull the kettle from the fire and beat down the foam, then replace on the fire and continue the addition of manganese. When the manganese is all in, cook at about 450° F. until taken up.

About 2 hours cooking will be required to take up the soluble part of the manganese, and the resultant "pill" must not be brittle, otherwise the japan will not mix with raw linseed oil. Thin at 450° F. or 420° F. with the heavy naphtha, and at 330° F. or lower, with the benzine.

EXTRA STRONG CONCENTRATED DRIER. No. 1007

Weight per gallon, 7.56 lbs.

Formula

50 gal. V. M. Linseed Oil.
100 lbs. Red Lead.
100 lbs. Plain Hand Rosin, No. 750.
75 lbs. Manganese Dioxide.
100 gal. Wood Turpentine.
100 gal. Naphtha, 54° F. (Benzine).

261 gal.
15 gal. Loss.

246 gal. Product.

Directions: Put 40 gallons of the linseed oil in the kettle, reserving 10 gallons of the oil for future use.

Heat the 40 gallons of oil in the kettle to 420° F. then commence adding red lead in small quantities.

Sprinkle the red lead on the surface of the hot oil and allow it to remain for 2 or 3 minutes before stirring.

Cook at 420° F. to 480° F. with frequent stirring and whipping down the foam when necessary, until the lead is taken up, which usually requires about an hour, then feed in the rosin and stir until dissolved.

After the rosin has dissolved and the temperature is up to about 420° F. commence adding the manganese, a little at a time, stirring frequently and whipping down the froth when necessary.

When about half of the manganese is in, add the 10 gallons of oil held in reserve, and bring the heat up to 420° F., after which continue the addition of manganese.

Cook at 420° F. to 480° F., preferably at about 450° F., until the manganese is taken up, known by a sample on glass showing a transparent amber color. About 2 hours will be required to take up the manganese, and the cooking is finished when a tough "pill," free from tackiness, is obtained. The "pill" must not be hard and brittle, for if it is the japan will not mix with raw linseed oil.

When the cooking is finished, pull from the fire and thin at 450° F. or 420° F. with the turpentine, which will drop the temperature to 320° F., or lower, then follow with the benzine.

LIVERING OF BONE BLACKS WITH GRINDING JAPANS.

In reply to your request of April 22 for an explanation as to "the cause of livering of bone blacks with grinding Japans," for the purpose of conducting a discussion on the subject in the Chemists' Forum, we would state that we have been unable to explain this phenomenon to our satisfaction.

We know that the claim is frequently made that bone blacks high in carbon content are more prone to liver than those of low carbon content. The higher carbon content blacks being supposed to contain recovered sugar house blacks. We have not been able as yet to confirm this claim.

Assuming that the grinding Japan is properly made, we have been unable to decide whether the phenomena connected with the livering of certain bone blacks are due to the physical characteristics of the carbon present in the black or due to chemical reactions between the constituents of the black with the constituents of the grinding Japan.

Acting on the supposition that substances other than the recognized normal constituents—calcium phosphate, calcium carbonate, and carbon—influenced the livering, two bone blacks were subjected to a detailed analysis. No. 1, exhibited the phenomena of livering, being a low-priced black and No. 2 being a black of the good quality which did not liver. The carbon contents of both were within one per cent of each other. The results are presented herewith:

	I	II
	Per Cent	Per Cent
Fat (ether soluble extract).....	0.07	0.08
Soluble salts.....	0.19	0.86
Soluble carbonate.....	None	0.01
Soluble carbonate.....	0.07	0.44

(Calculated to sodium carbonate.)

The soluble salts in each case were essentially sulphates and chlorides of sodium and potassium.

Another non-livering bone black of the best quality was examined and was found to contain 0.02 per cent calcium hydroxide and 5 per cent soluble carbonates, calculated to sodium carbonate. Examinations of other blacks gave similar results, and it appears doubtful in the writer's opinion if the impurities present have any influence on the livering.

Very truly yours,

C. D. Holley.

GLIDDEN CO. ENTERS NEW FIELD.

The Glidden Co. have taken a new step toward the control of raw materials in leasing the plants of the bankrupt Yaryan Rosin & Turpentine Co. for one year with an option to purchase at the expiration of the lease at a figure said to be about \$2,000,000. The plants at Gulfport and Brunswick are covered in the lease. The Yaryan Company has been operating under a receiver and turning a profit said to be approximately \$100,000 per month. It is understood that the capacity of the plants will be doubled and that linseed oil will be added to the products manufactured.

EIGHT HOUR LAW IN MINNESOTA.

The house labor committee held a hearing Tuesday afternoon before a large crowd on the Devold eight-hour day bill and the Lydiard bill providing one day of rest in seven for all employees. The Devold measure provides an eight-hour workday for employees of linseed oil plants, flour mills and for underground miners. J. W. Daniels, president Archer-Daniels Linseed Oil Co., Minneapolis, in opposing the bill declared that it would ruin this industry. Mr. Daniels suggested that a quarter of a cent added to the price of linseed oil would meet the extra expense incurred by working shorter time. Representatives of various Minneapolis milling interests and G. M. Gilette, president Minnesota Employers' association, spoke in opposition to the Lydiard bill.

PAINT COMPANY TO INCREASE CAPACITY.

The Penn Keystone Paint Company, at Antes Gap, near Williamsport, Pa., which has been running overtime to fill rush orders the past few months, is making preparations to make many improvements in the plant in the near future, which will mean many more employees.

All the old machinery in the plant will be taken out and replaced with new up-to-date machinery. The machinery, which is made in St. Louis, is expected to arrive within the next few days and will be installed at once. The officials of the concern claim that the paint is in such a demand that several car loads could be shipped every week if sufficient machinery and employees were available.

In the Present War Situation

with aniline colors scarce and difficult to obtain, a number of our fine high grade Black pigments may be satisfactorily employed as substitutes for many purposes, either straight or in conjunction with other colors.

If you have been using a Black of which you cannot now get a supply, why not try some of the fine pigments to which we refer? We may have just what you want and now is the time to try them out.

Write today for sample and particulars.

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INERT PIGMENT IN ANTI-RUST PAINTS.

A Reply.

Dear Mr. Howard:—I have read with interest the comments on barytes, lithopone, red lead and sublimed blue lead as related to their various properties when used as paint for the prevention of corrosion. Also note the statement that sublimed blue lead is composed of sulphides and that a certain amount of inert material in red lead is beneficial.

I do not desire to take up the cudgel in defence of any particular pigment, though the statements made by Baker in your paper do not accord with my experience. As I understand the problem of corrosion and its prevention by painting, it is absolutely necessary that the pigment used must be strongly basic or a chromate, and this pigment must be in sufficient amount so that every spot on the surface of the metal comes in contact with the inhibiting pigment. If mixed with an inhibiting pigment there be particles that are not inhibiting, but possibly accelerators, corrosion is apt to start at these unprotected points, and although the corrosion may be extremely slow at first, nevertheless the inhibiting action of the pigment has been reduced to such an extent that corrosion will be more rapid than if the inert or accelerating pigment were left out.

An excessive amount of linseed oil used with inhibiting pigments will act very similar to the dilution of these pigments with inert or accelerating products because there will be considerable distance between the pigment particles, the interstices between the particles being filled with linseed oil.

Such being my view of the theoretical action of inhibiting paints, I can see no reason from an efficiency standpoint for using inert material with an inhibiting pigment. I do not question, however, that a certain amount of inert material may cause red lead, or possibly any other pigment, to wear better when it is used in the top coat. However, red lead is never used as a top coat; instead, over the red lead is usually a paint designed to resist atmospheric conditions, regardless of its inhibiting qualities. A painted surface of this type is constructed along lines that are scientifically sound, because the metal is protected by an inhibiting pigment, and in turn the inhibiting pigment is protected by a paint film resistant to atmospheric conditions.

As a suggestion, my ideal scheme for protecting iron would be to use as a priming coat a finely ground pure red lead paint. The red lead, however, I believe ought to contain about 15 percent of litharge to obtain basicity, not litharge.

added as such, but what is known as red lead analyzing 85 percent Pb_3O_4 . Red lead of this type is a standard article, being specified by the Navy, New York City, and many railroads. Top coat the red lead with any weather-resistant paint.

H. A. Gardner, of the Institute of Industrial Research, Washington, D. C., has conducted a long series of tests on red lead of varying compositions, and inspection of his tests shows that a red lead containing 85 percent Pb_3O_4 , rather than a highly burned 90 to 98 percent Pb_3O_4 , is most desired for inhibiting paints. At the same time red lead could not be purchased on the market with a guaranteed Pb_3O_4 content; the commercial grades ran all the way from 50 to 85 percent Pb_3O_4 , and a paint manufacturer who endeavored to make paste or liquid paint from these products could never be assured that his paint would not harden in the package, because very often in one shipment he would receive lots that would show the above variation. However, the production of red lead now is under such control that a manufacturer can buy his red lead with a guaranteed Pb_3O_4 content, and it has been demonstrated over a period of years that an 85 percent Pb_3O_4 red lead can be used with perfect safety for making paste or liquid paints.

The reason lithopone perished so quickly on the Atlantic City Test Fence may be attributed directly to the well-known property of lithopone to oxidize from zinc sulphide to zinc sulphate. Zinc sulphate is soluble in water and very readily washes away, and, in addition, soluble sulphate accelerates corrosion very materially.

In sublimed blue lead, the sulphides are practically negligible, the amount is so small. It is the inherent basicity of sublimed blue lead that makes it a good inhibiting pigment. Sublimed blue lead is a basic sulphate of lead of about the following composition, according to Gardner and Cushman:

Lead Sulphate	50%
Lead Oxide	35%
Lead Sulphide	5%
Lead Sulphite	5%
Zinc Oxide	2%
Carbon	3%

In reading this analysis it should be remembered that the lead oxide and the lead sulphate are chemically combined as basic sulphate of lead.

Yours truly,

Edwin P. Lowe.

Standard Cooper-Bell Company

*Takes Over Standard Varnish Works
Business in Twenty-one States*

THE Standard Cooper-Bell Company, formerly the Cooper-Bell Varnish Company, announces that it has leased the Chicago plant of the Standard Varnish Works—and has licensed all of the Brands, Trade-Marks, Patents, and Trade Names of the Standard Varnish Works.

The Standard Cooper-Bell Company has secured the exclusive right to carry on the business conducted by the Chicago house of the Standard Varnish Works in the states shown. The Standard Varnish Works of New York will continue to handle the domestic and foreign trade outside of the states named. The new company offers you the full service of the combined organization—the same standard merchandise—and a great willingness to co-operate with you in every way.

STANDARD COOPER-BELL COMPANY

Factory and Offices: 2600 Federal St. CHICAGO



NEW JERSEY ZINC CO. SHOWS GAIN FOR FOURTH QUARTER.

The report of the New Jersey Zinc Company issued Monday for the last quarter in 1919 shows income, after the deduction of taxes, amounting to \$2,790,412, as compared to \$3,025,918 in the preceding quarter.

After deduction for other charges but before the payment of federal taxes, net income for the period was \$2,675,412, as compared to \$2,610,918 after the payment of charges and allowances for federal taxes of \$300,000 in the third quarter of the year. Surplus was set down at \$207,412.

Good In Combination.

Barium Carbonate, in so far as its covering quality is concerned, would be rated about, between Blanc Fixe and Zinc Oxide. When being used as a flat wall finish in conjunction with lithopone, Zinc Oxide, etc., it produces very satisfactory results. The surface will not be so apt to dust and the result is a coating of a soft velvety finish. This kind of a finish is greatly needed for use on flat wall surfaces and every experienced painter will attest to this fact.

NEW INCORPORATIONS.

Standard Color Works, Inc., Brooklyn, manufacturing all kinds of dyes, colors, chemicals, etc. Capital, \$25,000. Incorporators: J. Feibel, 296 Sterling Street; F. Schaefer, 272 Sterling Street, Brooklyn; R. R. Shearer, "Liberty Street, New York city.

Southern State Paint Manufacturing Co., Jacksonville, Fla. Capital, \$100,000. Incorporators: C. J. Baumgartner, C. I. Jennings and A. C. Shannon.

F. L. BROOKE TO OPEN BROKERAGE OFFICE.

F. L. Brooke, well known to the trade as manager of the purchasing department of the Chicago Varnish Company, has severed his connections after 21 years of continuous service with that concern and will engage in the brokerage business on his own account. He has secured temporary offices at 826 Peoples Gas Building, which will serve him until such a time as his permanent offices are ready. Mr. Brooke is a recognized authority on naval stores products and has been a power for good in his constructive work as a member of the Naval Stores Committee of the National Association. He has secured a number of accounts and is negotiating for others and will handle a complete line of naval stores as well as oils, colors and chemicals used by the paint and varnish manufacturing trades. Mr. Brooke will continue to operate the retail and steam coal business which he has conducted for the past twenty years in connection with his other business.

CALO A VICTIM OF AUTO THIEVES.

The comings and goings of P. E. Calo, the genial manager of the General Naval Stores Company, have been seriously interfered with through the heartlessness of an automobile thief.

Mr. Calo received a new four passenger Chandler roadster from the dealers on Tuesday last and on Thursday he was relieved of his treasure by a discerning thief, who selected his car from among hundreds of others parked in Grant Park.

The loss was fully covered by insurance and as soon as adjustment can be made and a new car delivered Mr. Calo will take up autoing where he so suddenly left off.

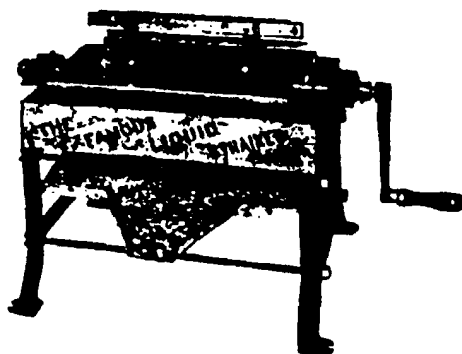
FROTH AS A FIRE-KILLER.

Froth—a thick mass of tiny stiff bubbles—is the latest agency proposed for stifling fires, especially burning liquids like petroleum or alcohol, which have always been practically impossible to quench. The froth, which consists of bubbles filled with carbonic-acid gas, is made quickly, as needed, by the mixture of two liquids which are kept separate until used. One is a soda-lye containing froth-forming ingredients; the other is a solution of alum, etc. Both liquids, it is claimed, can be kept exposed to the atmosphere, and require only that the water lost by evaporation should be replenished. The solutions do not freeze until the thermometer has gone down to — 5° Cent. (23° Fahr.). In one of several tests described in *Engineering*, 15 tons of crude benzine were lighted in a tank and produced enormous smoke clouds.

"After the fire had lasted five minutes, the foam was turned on under two-atmosphere pressure. There being a strong wind, the violent agitation of the burning liquid by the foam stream could be watched on the one side of the tank. The spreading foam-layer stifled the fire, but there remained, at first, some isolated flame jets, especially near the edge of the tank. In six minutes the fire was extinguished.

"Ten minutes later the liquid would at once relight when the foam had been swept away. The layer had a thickness of two inches five minutes after extinguishing the fire, which consumed nearly one ton of crude benzine. About 1,800 liters (475 gallons) of foam must have been used; some 4,000 liters (roughly 1,000 gallons) of foam must have been floating on the benzine immediately after extinction of the fire, and two-thirds of the original volume of the frothy liquid were lost owing to the use of the hose and the exposure to the air and flames. The experts concluded that the frothy liquid should be applied under small pressure, so that it may spread quietly without causing splashes and eddies which would rekindle the already stifled flames. The number and dimensions of the pipe and hose should be selected so as to insure a quiet discharge of the frothy liquid. * * *

"It would thus appear that huge oil and spirit fires can be dealt with by this system, with the aid of installation such as would not unduly complicate petroleum tank plants, oil and spirit stores, docks, etc. Some provision must be made for fire-extinction in all these cases and the additional cost would probably be moderate."



The Famous Paint or Liquid Strainer

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Will strain from five to ten gallons of paint or enamel per minute through 120 mesh screen.

A wonderful labor saving device. All parts are detachable. Strainer cloth interchangeable.

To clean and change from one class of work to another requires but a few minutes.

The machines are built in two sizes.

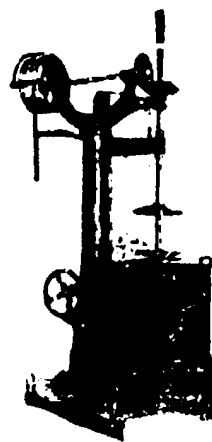
All machines are furnished with undertanks and faucets for can filling.

Over fifty of these machines are already in use among the best known paint manufacturers. We refer by permission to the Adams & Elting Co., Devoe & Reynolds Co., Wadsworth-Howland Co., Bradley & Vrooman Co., Sears, Roebuck & Co., and Heath & Milligan Mfg. Co., all of Chicago, Ill.

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Rapid Liquid Mixer With Portable Tanks

made in two sizes
Tanks 60 to 150
gallons capacity

Manufactured by the

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Builders of High Grade Paint
and Varnish Machinery.

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The Chemists' Forum

This department is maintained in order to meet a very general expression of the need for an open forum for the discussion of scientific and practical problems of a chemical character especially as related to the paint, oil, varnish, pigment, chemical and mineral dry color and gum industries.

It numbers among its staff of contributors the best known chemists in the business and is open to all who have a message for the allied trades.

THE DETERMINATION OF TITANIC OXIDE IN PIGMENTS WITH SUGGESTIONS FOR THE ANALYSIS OF MIXED PIGMENTS

By L. E. Barton

The commercial introduction of the pigment titanox has stimulated interest in methods for the determination of titanium and analysis of mixed pigments containing titanox. To meet the demand for a reliable method, the Titanium Pigment Co., Inc., has upon request, supplied copies of the volumetric method here given under the head of "Volumetric Method for Determinations of Titanic Oxide."

This method has been recommended for its accuracy and rapidity and because likely to prove generally reliable even in the hands of comparatively inexperienced operators. The method has the further advantage that the determination of titanium is not interfered with by the presence of other elements likely to be present and is therefore applicable to the analysis of mixtures of pigments. The disadvantage of the method is that it requires the assembling and maintenance of special apparatus and reagents; these, however, are usually not difficult to obtain and are easily kept in condition.

Analysis of Titanox

Determination of Barium Sulphate

Weigh $\frac{1}{2}$ gram sample into a 250 cc. Pyrex glass beaker; add 20 cc. concentrated sulphuric acid and 7 or 8 grams sodium sulphate. Mix well and heat on hot plate until fumes of sulphuric anhydride are evolved and then heat directly over flame to boiling for five minutes or until solution is complete. Traces of silica, if any, remain as an insoluble residue.

Cool, take up with 100 cc. of water, boil and filter off barium sulphate and silica, washing with 5 per cent sulphuric acid to free residue from titanium.

Volumetric Method for Determination of Titanic Oxide

The volumetric method used for determination of titanium is essentially that described by P. W. & E. B. Shimer, Proceedings of Eighth International Congress of Applied Chemistry; the method hereafter described differing principally in the form of reductor and also in a few details of operation.

Reagents: Standard ferric ammonium sulphate solution.

Dissolve 30 grams of ferric ammonium sulphate in 300 cc. water acidified with 10 cc. of sulphuric acid; add potassium permanganate drop by drop as long as the pink color disappears, to oxidize any ferrous to ferric form; finally dilute the solution to one litre.

Standardize this solution in terms of iron. The iron value multiplied by 1.4329 gives the value in titanic oxide (TiO_2), and iron value multiplied by .86046 gives the value of the solution in terms of metallic titanium.

Indicator: Saturated solution of potassium thiocyanate.

Reductor: As a reductor a 300 cc. Pyrex glass dispensing burette is used. The internal dimensions of the burette are $1\frac{1}{4}$ inches by 22 inches.

The reductor is charged with about 1200 grams of amalgamated zinc, making a column about 12 inches high and having an interstitial volume of about 135 cc. The zinc is supported by a platinum gauze covered with a $\frac{1}{4}$ inch mat of fibrous asbestos. On the mat is placed a one inch layer of 10 mesh zinc followed by a six inch layer of 20 mesh zinc and finally by a five inch layer of stick zinc. This form of reductor is convenient, and when used as hereafter described is

adapted to maintaining a hot solution, which is essential for complete reduction of the titanium.

The reductor is connected to a litre flask for receiving the reduced titanium solution through a three-hole rubber stopper, which carries also an inlet tube for carbon dioxide supply, and outlet tube for connecting with the suction pump.

The reductor is prepared for use by first passing through it a little hot dilute sulphuric acid followed by hot water, finally leaving sufficient hot water in the reductor to fill to the upper level of the zinc.

The hot filtrate from the barium sulphate determination is now introduced; about 100 cc. of water being drawn from the reductor into the original beaker to bring the solution to about the upper level of the zinc. The water thus removed will not contain any titanium if the operation has been conducted as described, but it serves as a safeguard and is also convenient to acidify this water with 10 cc. sulphuric acid and reserve it on the hot plate to be used as an acid wash after the reduction of the sample solution.

The titanium solution is allowed to remain in the reductor for 10 minutes.

While the solution is being reduced, the receiving flask is connected to the reductor and the air completely displaced by carbon dioxide* conveniently drawn from a cylinder of the liquefied gas.

When the reduction is complete the receiving flask is connected with the suction pump, and while still continuing the flow of carbon dioxide, the reduced solution is drawn out, followed by the reserved acid wash and then three or four 400 cc. washes with hot water. The displacement of the sample solution and washing of the zinc is so regulated by means of the stop-cock that the reductor is always filled with solution or water to the upper level of the zinc.

When the washing is complete, gradually release the suction to prevent air being drawn back into the receiving flask.

Disconnect the flask, add 5 cc. of potassium thiocyanate solution as indicator and titrate immediately with standard ferric ammonium sulphate solution, adding the solution rapidly until a brownish color is produced which will remain for at least one minute.

The brown color developed at the end point indicates that an excess of ferric ammonium sulphate has been added and the depth of color is roughly proportional to such excess. Ordinarily the excess ferric ammonium sulphate amounts to about .05 cc. which is deducted from the burette reading before calculating the titanium, thus increasing the accuracy of the result. It is desirable for each operator to establish for himself, by running a few blanks, the proper amount to deduct from the burette reading as a correction.

As the composition of titanox is kept constantly very close to 25 per cent titanic oxide and 75 per cent barium sulphate, the percentage of titanox can be calculated with sufficient accuracy for all practical purposes by multiplying the titanic oxide by four.

Gravimetric Method for Determination of Titanic Oxide

Notwithstanding the convenience of the volumetric method, before given, where frequent determinations of titanium are required, many requests have been received for a gravimetric.

*Cylinders of liquefied carbon dioxide, such as supplied to soda fountains, are convenient.

method simpler as regards apparatus and reagents and dependable where only an occasional analysis of titanox or determination of titanium is required.

The following gravimetric method for determination of titanium which has been used for many years for the determination of titanium in ferro alloys, has recently been investigated in the laboratories of the Titanium Pigment Co., Inc., and adapted to determination of titanium in pigments. The method is highly accurate if properly operated but requires a little practice to get best results. It is recommended that the method be first tried on samples of known titanium content.

Method

Decompose the sample and proceed as before described until the filtrate from barium sulphate has been obtained.

To the filtrate containing the titanium, add an excess of ammonia, filter and wash precipitate with hot water. Redissolve the precipitate in hydrochloric acid (1 to 1) and again precipitate with ammonia. Filter and wash with hot water combining filtrate with that from first separation.

The precipitate of titanium hydroxide is again dissolved in dilute hydrochloric acid (1 to 1), receiving the solution in a 500 cc. beaker and keeping volume of solution less than 150 cc. To the solution, while at a temperature of about 30° C. add ammonia gradually while stirring till the precipitate which at first forms just redissolves. Continue the neutralization by addition of ammonium carbonate finally adding drop by drop while stirring till a slight permanent precipitate forms. Add a drop or two of dilute hydrochloric acid just sufficient to dissolve the precipitate; then add 2 cc. hydrochloric acid (1 to 1).

The proper neutralization and adjustment of acidity is very important. If the solution is too acid a little titanium is liable to escape subsequent precipitation; if not acid enough the precipitate of titanium is liable to be slightly contaminated by iron or aluminum if present. The neutralization and adjustment of acidity is facilitated by the presence of iron in the solution, and if not present in the sample it is advisable to add enough to give a little color to the precipitate which is momentarily formed by addition of ammonia and ammonium carbonates.

Dilute the slightly acid solution to 400 cc. and pass sulphur dioxide* gas until the iron is reduced to the ferrous state and the solution smells strongly of sulphur dioxide; or add liquid sulphurous acid and make up to 400 cc. with water. Heat to boiling and boil till excess sulphur dioxide has been expelled and the solution smells very faintly of SO₂. By this means the iron is reduced to the ferrous state and the titanium precipitated.

Filter while hot, washing with hot water. Dry and calcine the precipitate for one-half hour at not less than 900° C. Weigh as TiO₂.

Suggestions for the Analysis of Mixed Pigments Containing Titanic Oxide

While the foregoing methods are directed particularly to the determination of titanium, it is believed the procedure in decomposition of sample, separation of groups and final separation and determination of titanium will be found serviceable in the general analysis of mixed pigments.

In case of mixed pigments containing titanic oxide proceed as follows: Weigh one gram sample into a 400 cc. Pyrex glass beaker, add 10 grams sodium sulphate and 40 cc. concentrated sulphuric acid (93 per cent). Heat on hot plate for one-half hour and then increase the heat, as by placing the beaker directly over the coils of an electric hot plate and boiling for about 10 minutes. The solution should acquire a temperature of about 335° C.

Cool, dilute the solution to 300 cc., boil 20 minutes, filter while hot and wash residue and precipitate with 5 per cent sulphuric acid. On the filter will be silica and undecomposed silicates and all the lead and barium as sulphates. This residue and precipitates can be analyzed by well known methods

if desired. The filtrate will contain the titanium, iron, aluminum, zinc and calcium.

To the filtrate while still hot add an excess of ammonia, filter and wash precipitate with hot water. Redissolve precipitate in hydrochloric acid (1 to 1) and again precipitate with ammonia. Filter and wash with hot water combining filtrate with that from first separation. By this procedure the titanium, iron and aluminum will have been separated from the zinc and calcium. The use of an excess of ammonia as described would tend to carry a little aluminum into solution but in the presence of titanium and iron substantially all the aluminum will be found in the precipitate. If desired, the filtrate can be tested for presence of aluminum and then used for determination of calcium and zinc.

The precipitate of titanium, iron and aluminum hydroxide is again redissolved in dilute hydrochloric acid and the titanium separated and determined as before described and with all precautions given under the head of "Gravimetric Method for the Determination of Titanic Oxide."

The filtrate after separation of the titanium can be used for determination of iron and aluminum if desired.

In case it is not desired to determine iron and aluminum separately the hydroxides obtained after second separation by ammonia can be calcined and weighed as total oxides of titanium, iron and aluminum. The titanium can be determined by the volumetric method before given and deducted from total oxides thus giving the iron and aluminum together by difference.

TITANIUM BY NORWEGIAN PROCESS.

W. H. Washburn, a representative of the Titan Co., of Sogndal, Norway, recently prepared a paper to be read before the Paint and Varnish Society of Great Britain, which was in part as follows:

The material used for the manufacture of titanium pigments, is the mineral ilmenite, which is a compound of iron and titanium dioxide, with the approximate chemical formula FeOTiO₂. The titanium pigments now produced are classified as: (1) So-called titanium whites, consisting chiefly of titanium dioxide. (2) So-called composite pigments, being chiefly titanium dioxide precipitated on a barium sulphate base. For making titanium dioxide the finely pulverized ilmenite is mixed with ordinary concentrated commercial sulphuric acid. The mass is heated, whereby a violent reaction between the acid and the ilmenite takes place, thus transforming the titanium and iron contents of the ore into titanium and iron sulphates. The coagulated mass is afterwards dissolved in water and freed from undecomposed minerals through a setting process. The clear solution, containing the titanium and iron sulphates, is afterwards heated to boiling temperature by means of indirect steam, which causes the titanium to precipitate in the form of titanium hydrates, chiefly meta-titanic acid—TiO₂—with water of combination. The titanium precipitate thus obtained is washed until free from iron. The precipitate contains small quantities of free sulphuric acid and of acid sulphates of titanium, which are neutralized by the addition of barium carbonate. The neutralized precipitate is afterwards calcined to remove the water of hydration, and further to convert the titanium dioxide so produced into a crypto or micro-crystalline condition. The process for the manufacture of the composite pigments is broadly as follows: Ilmenite is smelted in an electric furnace with certain fluxes, whereby is produced a titanium concentrate, which is afterwards dissolved in sulphuric acid. This forms a solution of titanium sulphate comparatively free from iron, most of the iron having been eliminated from the concentrate in the smelting process. The titanium sulphate solution is mixed with blanc fixe and the mass boiled by indirect steam, thereby precipitating titanium hydrates upon a base of blanc fixe. By subsequent calcination the amorphous precipitate is converted into the crypto or micro-crystalline state. After calcination the pigment is carefully pulverized and air-floated, so as to yield a product of the highest possible fineness and uniformity. The paper next dealt with the physical properties of the titanium pigments. It was claimed that they possess a low specific gravity (less than that of white lead, zinc oxide, or lithopone), a micro-crystalline structure, and high refractive indices. They were also commended for fineness.

*Liquid sulphur dioxide can be obtained in cylinders from the leading chemical supply houses. The Virginia Smelting Co. has recently developed a new cylinder for liquid sulphur dioxide, designed for the convenience of laboratories. The cylinders can be shipped by mail or express for refilling and return.

"Save the Surface and You Save All"

THE long heralded and expected "Use More Paint Campaign" has at last become an accomplished fact. The details are outlined in another column and show a well developed plan carefully worked out.

The "Slogan" on which the greatest stress is laid by the advertising agents is "Save the Surface and You Save All" of which the proposers say:

"It is fundamental in sense—tying up with the broad viewpoint of the campaign. It is comprehensive—applying to anything that needs surface protection. It is impartial—laying no emphasis either on paint or varnish or any of their specific applications. It is rational, avoiding obvious cleverness. It is alliterative, easily taken into the mind. It is adaptable, fitting naturally into sentences of copy belonging to this campaign or belonging to the campaigns of subscribing members. It escapes the detriment of selfishness, the reader's mind being turned not to your products but to his property."

All these statements may be true but "Use More Paint" really seems to meet the needs of the case quite as well with the one exception that it must be taken to include varnish which it does in the minds of the public generally and "Use More Paint" would take no explanation as to its meaning which "Save the Surface" will. On the other hand "Save the Surface" may arouse curiosity and set the public thinking and that is a most desirable condition.

"Rust and decay, wear and disintegration begin at the Surface. Preservation begins at the surface. To quote again many natives now exist which lead people to coat surfaces. Chief among them are—preservation and beautifying. Preserva-

tion is selected for the key-note of this campaign because its appeal is widest. It reaches direct to cupidity and sense of possession—universal attributes. Beautifying, already well sold, reaches to a sense of taste and pride of appearance, a narrower field. It is the purpose of this campaign to create this habit of thought—namely, that of regarding the surfaces of the things we own as the points where deterioration and loss begin; therefore, where preservation, which is prevention of loss, must be applied."

There is a certain compelling logic about this statement which indicates careful study on the part of the men who are to handle the details and augurs well for the results.

Another interesting feature of the campaign is that two weekly publications with a circulation approaching two millions will carry the bulk of the advertising for the first year with the slight addition of ads in the "patent insides" of a list of country papers. This may be the easiest way of placing advertising, possibly even the cheapest, per million of readers but we cannot agree with the advertising agents that it has the greatest compelling power because the average American is a man of tastes and prejudices and he is influenced more by his "favorite" paper than by any other and only by increasing the number of mediums can you increase the number of favorite papers of many classes and descriptions. However, be that as it may we recognize the good constructive work that has been done on this campaign and the wise foresight and liberality with which it is being supported by the trade and predict a great increase in general sales of paint as a result.

MILWAUKEE R. R. HOLDS SPRAY MACHINE TEST.

The introduction of labor and time saving machinery by the railroads and other large users of paints and varnishes in an industrial way is becoming more general as the scarcity of competent and experienced help increases. At the request of the Chicago, Milwaukee & St. Paul R. R. a comparative test of various makes of spraying machines was made at Milwaukee last week. The test was in charge of J. L. Green who represented the general manager. Demonstrations were made by three spray machine manufacturers on bridge painting, box car painting, stenciling, building painting, etc. The audience included representatives of various departments from the entire Milwaukee system. All were well impressed with the practicability of the spray machine and the extension of its use to take the place of maintenance labor that is so hard to get at this time.

The companies represented and speakers demonstrating the equipment were as follows: De Vilbiss Mfg. Co., Toledo, Ohio, W. J. Miskella, Chicago manager; Paasche Air Brush Co., Chicago, Mr. Bartling; Spray Engineering Co., Boston, Mr. Stokes.

KENTUCKY COLOR AND CHEMICAL CO. BEGINS PRODUCTION UNDER MOST FAVORABLE AUSPICES.

Mr. Sevier Bonnie, Vice-President of the Kentucky Color & Chemical Co., Inc., states that their fine new plant at 34th and Tyler streets, Louisville, is at last turning out an exceptional quality of colors. He says "Our results with the first batches of dry color exceed expectations. The colors are remarkably strong and clean." The fact that the company have installed the very latest word in modern machinery, filters, mills and mixers, and that they include in their management expert color makers of long experience and recognized standing would account for these very gratifying results. The personnel of the company officials consists of Arthur W. Clark, President, who was well known during his connection with the Heath & Milligan Mfg. Co. of this city as head of their dry color department, Dr. Geo. A. Goodell, Secretary, who was in charge of the Sherwin-Williams

Co.'s Kensington dry color plant. Sevier Bonnie, Vice President, and Robert Bonnie, Treasurer. The Bonnie brothers are widely known and successful business men of Louisville. They will be a welcome addition to the ranks of paint material producers.

F. A. Stresen-Reuter, President of Stresen-Reuter & Hancock, Inc., has gone to Macatawa, Michigan, for a two weeks outing and a much needed rest. Mr. Stresen-Reuter has recently completed a new bungalow at Macatawa, where he expects to spend the summer with his family.

NEW VARNISH COMPANY FORMED.

THE John A. Steen Varnish Company of Chicago has been organized with an authorized capital stock of \$50,000. The incorporators are John A. Steen, Sidney Adler and R. Aronson. Mr. Steen is well known in Chicago paint circles, having represented the Standard Varnish Company in this section for twenty-one years and having had an experience of over thirty years in the varnish business.

It has been impossible in the short time before going to press to locate Mr. Steen, but through other sources we learn that the company have leased the plant of the old La Salle Varnish Company on Shields Avenue and will manufacture two lines of varnish only at present, grinders' and architectural.

TRIGG PRESIDENT PHILADELPHIA CLUB.

At the regular quarterly meeting of the Paint Manufacturers' Club of Philadelphia, held on June 18th, Mr. Ernest T. Trigg was unanimously elected President, succeeding Mr. William Waterall, who had declined re-election at the annual meeting, but whom the Club had since been endeavoring to induce to withdraw his declination. Mr. Waterall was elected Honorary President of the Club and an honorary member of the Executive Committee.

TWO PAINT CONCERNS CONSOLIDATE.

On Wednesday, January 5th, the well-known paint manufacturing concern of Benjamin Moore & Co. purchased the control of the Becker-Moore Paint Co., St. Louis, Mo. This was brought about by the belief that it would be to the advantage of both the company and its customers, as it gives to both additional advantages, among others being that The Becker-Moore Paint Co. will have the advantage of laboratories and all other equipment of the larger and older concern.

A varnish factory, which is now in operation, has been added to the works in St. Louis, and in addition, adequate facilities for the manufacture of wall finishes. The management of The Becker-Moore Paint Co. will continue as heretofore and there will be no change made in their brands, trade marks or labels. The high standard of the goods will be maintained and the same courteous treatment as heretofore will be given to the trade.

The Becker-Moore Company, which already has a plant occupying virtually a block on South Second, Carroll and Souldard streets, is to be enlarged greatly and new plants are to be constructed. Under the consolidation, Benjamin Moore, president of Benjamin Moore & Co., becomes president, and Richard Moore, former president of the concern and a brother of Benjamin Moore, becomes vice-president and general manager. F. S. Skeen retains his position as secretary and C. A. Becker will continue as treasurer.

Benjamin Moore & Co. is a \$3,000,000 corporation and manufactures extensive lines of paint and calcimine.

The only change among the St. Louis officers of the company is the abolishment of three vice-presidencies. They are E. C. Becker, who is retiring owing to his advanced age and fortune; L. P. Teuscher and W. H. Scott. There will be no change in the departmental managers.

PICHER, A GREAT NEW ZINC CAMP.

The Picher Lead Company seems likely to become one of the world's biggest zinc and lead operators, if the extensive development work and large mineral holdings of that company are an indication in that direction. For years the Picher Lead Company has conducted the greatest lead works in the southwest and within the past few years these works have been much enlarged until they have grown to be one of the biggest in America.

Now the Picher company has gone into the production of zinc on the same gigantic scale and has already expended about \$250,000 in securing mineral lands and leases and developing them in Oklahoma. The magnitude of this company's holdings and the importance of its interests in that locality have resulted in the establishment of a new and prosperous

A COMMENT ON THE "FORMULA FOR SCIENTIFIC REDUCTION OF PAINTS, ETC."

In the PAINT, OIL AND DRUG REVIEW of May 8th, the Chemist's Forum contained a "Formula for Scientific Reduction of Paints," the use of which unquestionably eliminates waste from "over-weight." I wonder, however, whether Mr. Tate is really serious when, in speaking of "discovering the law of scientific reduction," he says: "I find the following formula will give the exact amount of liquid to add in order to reduce a paint from any weight to any desired weight, after making several thousand experiments."

(a-c) b

Mr. Tate's formula is:

$$x = \frac{c-d}{c-d}$$

where "a" is weight per gallon in batch

"b" is number of gallons in batch

"c" is desired weight per gallon

"d" is weight per gallon of thinner

and "x" is number of gallons of "d" required to reduce "a" to "c"

A simple operation in algebra yields the following results:

The weight of the batch, a. b, plus ab + xd = c(b + x)

weight of thinner added, x. d, equals

the final total weight, c(b + x) (a-c).b

which simplifies to x =

$$\frac{c-d}{c-d}$$

This is identical with Mr. Tate's formula. Why, then, perform "several thousand experiments" to obtain a formula so easily deduced beforehand by common algebra?

Albert B. Bingham.

Long Island City, N. Y.



Azo ZZ—Lead Free. Azo ZZ—Under 5% Lead. Azo Z—8-10% Lead

Azo Zinc Oxides are more than ordinarily worth while, and the prompt service we offer is unexcelled.

AMERICAN ZINC, LEAD & SMELTING CO.

Pierce Bldg., St. Louis, Mo.

Equitable Bldg., New York

NEW INCORPORATIONS.

The C. Masek Glue Company, Cleveland, Ohio. Capital \$75,000. Incorporators: Charles Masek, Barbara Masek, Charles Masek, Jr., Albert H. Gyssler, Anna Gyssler.

The F. P. Collins Paint Co., Syracuse, N. Y. Capital \$60,000. Deal in paints, oils, lead, varnishes, glass and all painters' supplies. Incorporators: Frank P. Collins, Wm. E. Collins, John E. Collins, Syracuse.

The Crescent Color & Chemical Works, Inc., New York. Capital \$100,000; manufacturers of pulp colors, aniline dyes, paints, etc. Incorporators: W. J. and A. Alexander, 450 West End avenue, New York.

The Black Eagle Manufacturing Co., Birmingham, Ala., to manufacture, sell and deal in paints, oil, lubricants, etc. Capital \$4,000. Officers: A. A. Carlin, president; Byron Trammell, vice-president, and R. J. McGavock, secretary-treasurer.

The Buckeye Oil & Paint Co., Cleveland. Capital \$10,000. Incorporators: Mark A. Copeland, Jas. E. Walsh, C. A. Mowery, O. E. Schulz and C. Verbsky.

TO IMPART pure Raw Linseed Oil with drying qualities, without using chemicals or otherwise distorting the oil in the process of manufacture, was a long cherished dream of the paint manufacturer as well as of the painter. This is natural; the painter knows that all his application and skill will be lost if the materials he is using will spoil his efforts. The painter has confidence in pure Raw Linseed Oil, but experience has shown him that some of the so-called Boiled Oils have been robbed of all the fine qualities of the original product. This probably explains the tremendous success of Kellogg's Improved Boiled Linseed Oil.

THE FACT that Kellogg's Improved Boiled Linseed Oil has about the same color as Raw Linseed Oil instead of the cherry red given to it by a crude process of manufacture; the fact that it has about the same body as Raw Linseed Oil; that it is 100% pure without rosin or rosinates, and analyzes the same as the highest type of pure Raw Linseed Oil; is sufficient proof of perfect final results. That the phenomenal success of Improved Boiled is justified, can easily be proven by a comparative test with other products. Kellogg's Improved Boiled is guaranteed to consist of 99.8% finest quality Linseed Oil plus 0.2% lead and manganese scientifically incorporated.

The Test Will Tell

Spencer Kellogg & Sons, Inc.

General Offices: Buffalo, N. Y.

Chicago Office: 1351 North Branch Street

Branch Offices and Stocks in All Large Cities

PRICE COMPARISON.

It seems appropriate in view of the unusual conditions in the paint and varnish industry to give a few comparisons in prices, both as a matter of information and record, so they can be looked back upon and future generations in the paint trade may read the history of the strenuous times their ancestors experienced.

It is interesting to note that at present white lead, both dry and in oil, is selling at the highest price ever recorded except during June, 1915, when the basis was about the same, except that linseed oil last June was on a much lower plane, while dry white lead then was a fraction higher than at present.

A comparison in cost of a few of the leading articles in quantities during June, 1915, and March, 1916, are as follows:

	June, 1915	Mar., 1916
Pig lead, per cwt.....	\$7.25	\$7.30
Dry carbonate white lead, per lb.....	.07 3/4	.07 1/4
Selected oxide of zinc, per lb.....	.07 3/4	.09 1/4
White Seal oxide of zinc, per lb.....	.26	.25
Lithopone, per lb.....	.05	.15
Barytes, per ton.....	16.00	20.00
Linseed oil, per gal.....	.56	.78
China wood oil, per lb.....	.06 3/4	.14 3/4
Soya bean oil, per lb.....	.04 1/2	.09 3/4

No effort has been made here to take up anything but the materials which affect the basic cost of paints. Reds, blues, chrome green and chrome yellow have all advanced to unheard-of prices. Enough is shown here to indicate that the present prices of mixed paints are not only justified, but higher prices are warranted and are more than likely to occur at any time. At present paint manufacturers are absorbing, to their own loss, a good proportion of the increase in cost of manufacture. Dealers should keep themselves fully posted and watch their percentage of cost and profits or they will be losing money instead of making it.

THEODORE ROOSEVELT.

However we may have differed from him, and perhaps at times disapproved of his actions, no patriotic, loyal American can fail to feel a sense of loss at the taking away of Theodore Roosevelt nor to admit that one of the greatest of our leaders has gone to his reward.

NEW SEATTLE PAINT FACTORY.

Making the third move in the last twelve years to larger quarters, the Seattle Paint Company has let a contract for the construction of a modern paint and varnish manufactory to be erected on a site 60x277 feet at 1046 Dearborn Street. The warehouses and offices of the company will remain at the present location, Third Avenue and Jackson Street.

The business of the company has made necessary the plans for the new factory, which will comprise a three-story brick and concrete structure to house the paint factory and a smaller structure to house the varnish factory. Up to the present time the company has been engaged in making paint only, but is now preparing to launch into the varnish-making business also.

The estimated cost of the new factory, including buildings and machinery, is about \$40,000. The buildings will be completed by February 1. F. S. Roddie is president and general manager of the concern.

A. V. CRARY NEW VICE PRESIDENT OF COOK PAINT AND VARNISH CO.

The lure of the paint manufacturing game and the phenomenal opportunities it presents to the wide-awake business man has succeeded in enticing from Chicago trade circles one of its most widely known and representative members in the person of Arthur V. Crary, district sales manager of the American Can Company, who on March 1st becomes associated with the Cook Paint and Varnish Company of Kansas City, Mo., in the capacity of vice president.

Mr. Crary, a native Chicagoan, hardly needs an introduction to our readers as his activities as head of the largest division of the largest can manufacturing concern in the country coupled with his prominence in club affairs together with his instantaneously pleasing personality has made his acquaintance among the trade nation-wide.

WM. ZINSSER & CO., INC., EXPANDING.

Wm. Zinsser & Co., Inc., New York, are breaking ground for a \$75,000 additional unit to their New York City plant. Upon completion of this building, the plant will occupy eight city plots. The rapid growth of the business in recent years, necessitates increasing its manufacturing space, particularly in the white shellac department. The new vacuum process for white shellac seems to have proven a decided success.

At the same time, it is planned to move the present downtown warehouse up to their factory, centralizing production and shipping facilities, and to give over their entire building at 195 William Street to office and sales purposes exclusively.

The Future of the Naval Stores Industry

LIKE many of our American industries which have grown up in the midst of an abundance that was looked upon as limitless, the naval stores industry has gone on in a career of wasteful extravagance so far as the destruction of our forests is concerned, paralleled by the lumber, wood pulp and other similarly destructive agencies. Reforestation has not been carried on to any extent and the pulling and burning of stumps has been counted as too expensive to make reclamation by this method worth while. Now the far-sighted men who are watching the industry realize that without some great change in policy the days of old fashioned methods are numbered. High wages, a short working season, and old fashioned, primitive, slow, unorganized methods of producing and handling all tend against the prolongation of the business in its present condition when pine timber gets perceptibly scarcer.

Some of the big interests who have recently purchased large southern chemical distillation plants evidently recog-

nize this condition and expect to eliminate waste, profitably use up the wood and stumps on what is now waste land and then sell it for cotton and other crops. The plan is a far sighted one and includes the education of the American public to the use of wood turpentine which may perhaps be made more available as the years go on by the attention of skilled chemists, and will at all events supply a considerable element of stability to what has proved of late an exceedingly excitable market. There are a large number of other by-products and it is believed that wood pulp may also prove to be one of the large salvage factors of the new modern systems. Present owners of stills and forest lands in the south should watch this development with particular care in order to keep up with the times and northern consumers may have to revise their attitude toward products of wood distillation. They cannot well afford to do otherwise if the difference in cost between wood and gum turpentine continues to widen.

Big Linseed Merger

THE merger of two of the largest linseed crushing companies in the country is announced by dispatches as we go to press. Rumors which had been current for several weeks were confirmed by the announcement that the Archer-Daniels Co. and the Midland Linseed Products Co., both of Minneapolis, had joined forces under the name Archer-Daniels-Midland Co.

The new company will control about 35 per cent of the total linseed oil production of the United States and will have tangible assets of \$15,000,000, it is said. Their average annual net sales for the past six years are stated to be upwards of \$40,000,000 and their average profits, \$1,350,000.

The new company will have two mills each in Minneapolis, Buffalo and Edgewater, N. J. and one mill each in Chicago and Toledo, O., and it is believed that "substantial economies" will follow the consolidation.

The Prohibition of Lead

THE attempted prohibition of lead in paint manufacture at the International labor conference at Geneva was apparently an instance of hold-up methods similar to those employed by similar sinister labor interests in this country. The reports which have continued to come in from that meeting have been colored by the varying attitudes of the authors. One disreputable sheet in this country, which has long been recognized as a blackmailing excrescence on the industry, suggests that the prohibition should be extended to Uncle Sam's domain—but there is little danger of any such outcome.

The general use of lead in paint manufacture is too important to the industry and a suitable substitute too difficult to find to make the very slight danger to the average workmen a sufficient reason for prohibition. All the modern data on the subject tend to show that the toxic properties can be entirely obviated by a little judicious care and cleanliness, and that at worst they do not begin to be as dangerous as many other substances of common use to which no objections are raised.

Everything goes to show that the foreign leaded zinc interests are the source from which the propaganda in favor of prohibiting lead arose for they palpably give away their hand in permitting a certain small percentage of lead to be used.

Testing Paint by Ultra-Violet Rays.

THE slow process of testing paint by exposure to the weather has long been a source of annoyance to manufacturers, and an investigation of methods for getting a good endurance test in a short time has been going on for some time. The results of this investigation were stated in an address by Frank G. Breyer, the well known research chemist of the New Jersey Zinc Co., before the New York Section of the American Chemical Society last week, of which we have only a brief report. He said that how long paint would last could now be determined by the use of the ultra-violet ray and other methods including various mechanical processes which have been developed to represent the effect of weather and time so that manufacturers of paint may be able to foretell just how well their goods will wear after they have been applied to various surfaces.

The use of the ultra-violet light caused the different pigments used in both paint and rubber to be identified without recourse to chemical analysis. Six pigments

which in ordinary life seem to be white revealed all colors of the rainbow when exposed to the ultra violet rays. One of the white pigments became radiant, just as do the so-called radium dials on a watch.

Mr. Breyer said that the destruction of the ordinary paint on the outside of a building was largely due to the effect of the ultra-violet light which is present in sunlight. Some of the hardening and the short life of tires and rubber articles the speaker attributed to this same agent. The reflection to the ultra-violet light by pigments is therefore a very valuable quality, and those which ward off the rays the most are therefore desirable for use both in paints and in rubber goods.

CHEAP ANTI-RUST PAINT

Coal tar is melted with about 20 per cent of gas tar and about 5 per cent powdered sulphur is added. The mixture is then heated to about 150 to 160 degrees C. for about 2 to 3 hours, until all of the sulphur has been dissolved. The cooled mass is diluted with just so much benzol as will enable it to flow from the brush. Various pigments may be added as well.

OBITUARY.

William Whittier.

One of the pioneers of the San Francisco paint colony passed away recently at Hemet, near Los Angeles, and many friends throughout California are mourning for William Whittier. Mr. Whittier was some time ago interested in the old firm of Whittier-Fuller Paint Co., and more recently in Whittier-Coburn Co., of San Francisco, which company was taken over a couple of years ago by the Glidden interests.

CALIFORNIA INK CO. TO SELL COLORS TO THE TRADE.

The California Ink Co., of San Francisco, whose factory is at Berkeley, Cal., are just completing a new \$100,000 unit of their plant. It will be utilized solely, for the manufacturing of yellows, blues and greens. The old plant will be used for the manufacture of their red toners and lakes. A good portion of the colors produced will be used by themselves in manufacturing ink, although they will solicit outside business and they have already quite an established business among the paint grinders. Fifty thousand dollars additional has also been expended in the construction of a new boiler plant, and with many smaller alterations to be made, a total of approximately \$200,000 will be expended in putting their factory into shape. The main office will be removed from San Francisco to the Berkeley plant, although they will maintain, in the former mentioned city, an office to handle the sales end of their business.

GERKE LEAVES MARTIN-SENOUR CO.

The trade will be interested in learning of the announcement that W. H. Gerke has resigned from the position of general manager of the Martin-Senour Co. Mr. Gerke is well known in the paint industry in both the United States and Canada. His connection with the industry dates back more than thirty years, during all this time being connected with the Martin-Senour Co.

HELP THE STARVING CHILDREN.

The cause of the starving children of Europe has been presented to this country by all the great philanthropists, headed by Herbert Hoover who has explained that the need is great this year to prevent suffering, degradation and death. Another year the crisis will have past and the responsibility removed. Ten dollars will save the life of one child and the paint trade have been asked to do their share. Unfortunately the request came late and the responses up to the present time have been confined to comparatively few. All who contemplate giving or who have given will confer a favor by notifying Mr. Howard Elting, 1833 Seward Street, in order that the Chicago paint trade may be properly credited.

IMPROVED METHOD OF MANUFACTURING COLD WATER PAINT

Proper Combination of Casein and Hide Glue as Binder Give a High Grade Product Easily Manipulated.

By Milton D. Swartz, Farboil Paint Co.

Although there is still some small market both in this country and abroad for water paints in liquid and in paste form, the vast majority of water paints are manufactured and sold as a dry powder. The consumer has only to add water and use.

The saving in cost of slack over tight cooperage; the saving in freight in not shipping water; the saving in handling tonnage in not handling water, are all so very large and apparent that even the casual reader quickly appreciates why water paint today is practically all manufactured in dry powder form.

To be a successful commercial article a good cold water paint must quickly and easily mix with cold water, must brush easily, cover well, flow well, not show laps or brush marks, must not settle in the bucket, and most important from the standpoint of the ultimate consumer, must not rub off.

The ability to not rub off in a cold water paint depends on the binder. That is, on the adhesive material employed to hold the pigments together and to the surface. The three principal adhesives used as binders in cold water paints are casein, glue and vegetable starches and dextrans. Some few other binders are used, but the amounts are small.

Casein alone makes the most water-proof binder. However, it is not so easily controlled, and has the added disadvantage that it is not soluble in water alone, without the addition of chemicals.

High grade hide glue, although not as water proof as casein, is the next best binding material, having splendid sticking and lasting qualities. High grade glue, however, has the disadvantage of not being quickly soluble in cold water.

Vegetable adhesives most quickly soluble in water are weak when compared to animal glue and are the least lasting of any of the three adhesives mentioned.

For the water paint manufacturer who wishes to make a high grade product and who wishes to use casein and high grade glue, there arises the problem of introducing these not easily soluble binders into the water paint, in such form as to be quickly and easily soluble when used by the consumer.

Some manufacturers using glue alone are attempting to solve this problem by using a very finely ground low test glue, and mixing same thoroughly with the powdered pigments.

If the glue is of low enough strength and finely enough ground, and completely enough dispersed, and the water not too cold, it will form a jelly, and go sufficiently into solution to act as a binder. It will do the work, but only in a fair manner. The finished

product will not be lasting and durable. These low grade glues quickly disintegrate in damp weather, and the cold water paint soon begins to rub off.

Another method at present being employed is: The glue is first dissolved in hot water and to this solution is added a certain proportion of dry white pigment. This combination is thoroughly mixed to a stiff paste in a steam jacketed mixer. This paste is then dehydrated, dried and ground. The dry ground powder is then again mixed with the balance of the dry pigments to be used.

Superficially this method would seem to solve the problem. The dispersion would seem to be excellent. The result, however, is again only a fair water paint and not a durable, long lasting product. To obtain enough sticking strength to be real durable, too much glue would have to be used. An examination under the microscope by a chemist who understands the colloidal action of glue in the presence of whitening or clay, quickly reveals the reason why.

The writer has given this question a good deal of study and experiment and after tedious work, has found a method of making a binder with a combination of casein and high grade hide glue, and introducing same successfully into a cold water paint. Resulting in a cold water paint of very high type, a product according to the writer's tests and opinion superior to any other on the market.

Briefly outlined the method is as follows:

First, the casein is put into solution with a minimum of water by agitation and heat, and the addition of a small amount of mild alkali.

Second, the very high grade hide glue is put into solution with a minimum of hot water.

Third, the casein and glue solutions are then run together into a steam jacketed container.

Fourth, the alkalinity is almost neutralized with a mild organic acid.

Fifth, the container is then closed, and the mixture heated under pressure.

Sixth, it is now ready for introduction into the dry powder water paint mixture.

All of the dry powder ingredients, including the dry colors are put into a horizontal ribbon type mixer. This dry powder mixture is then violently agitated for fifteen minutes.

This dry powder mixer is of metal and holds two tons. It has a tight fitting top cover. Directly under this cover and over the top of the materials being mixed, is a jacketed distributor pipe, running the length of the mixer. On this pipe are connected 12 fan shaped spray nozzles.

After the dry powder has been mixed fifteen minutes, the casein and glue solution is filled into the jacketed distributing pipe under pressure, and is forced out of the narrow orifices into the mixer over the violently agitated dry powder in a fine spray. This spray condenses on the surface of the violently agitated dry powder in the mixer in minute crystals, and is thoroughly mixed therewith. The spray occludes air in cooling and drying, and presents a large surface which makes it quickly and easily resolvable.

After the mixing is completed, the mixed material is ground in order to eliminate occluded air (which would leave pin-holes on the surface of the finished paint), and to more thoroughly develop the strength of the tinting colors. After the grinding, the product is bolted, and is then ready for final packing.

Exhaustive comparisons between a product made in this manner, and with every other cold water kalsomine or paint that the writer has examined, has proven that a product made in this manner with this class of binder is the most lasting and durable.

The control and operation of the apparatus is simple. The principal points of precaution necessary are:

First, the control of alkalinity of the casein solution. It must not be neutralized to the point of precipitation. Second, all of the apparatus must be well jacketed and kept hot.

Classified Advertisements

Rate, \$3.00, minimum space eight lines or less. Each additional line—six words allowed to line—twenty-five cents.

Wanted—Position in a paint factory; 25 years practical experience in the manufacturing of paints and enamels for all purposes; capable of taking full charge of factory; formulating, tinting, testing all raw materials—chemically and practically; taking charge of help and getting results; present position eight years as superintendent of small paint concern. Address Box 1626, care Paint, Oil & Chemical Review. 1-17-31

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CELANESE ANNOUNCES

a PVAc solution to the problem of Chalky Surface Adhesion!

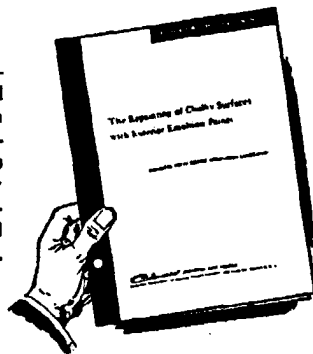
Formulating Information Now Available to Manufacturers of Exterior Paints, Primers and Other Finishes for Difficult or Dirty Surfaces.

In spite of the acknowledged superiority of PVAc water system paints in moisture-vapor transmission and blister-inhibiting characteristics, the problem of painting over chalky and dirty surfaces has limited their use in certain exterior applications.

Now, through a Celanese research study and development, comes a new formulation that produces a PVAc exterior paint with penetration and adhesion characteristics equivalent to, and in some cases, exceeding oil based and alkyd based paints. And this without surface preparation! More important, this modification of formulation does not destroy the water clean-up properties in PVAc emulsion paints, nor affect their natural resistance to alkali, and to yellowing on exposure.

The Celanese research laboratories has prepared an illustrated manual covering in detail this latest PVAc development. You are invited to send for your copy. Just fill out and return the coupon below. Celanese are producers of the famous PVAc resin emulsions: CL-102 Homopolymer and CL-202 Copolymer, and other resins. Celanese®

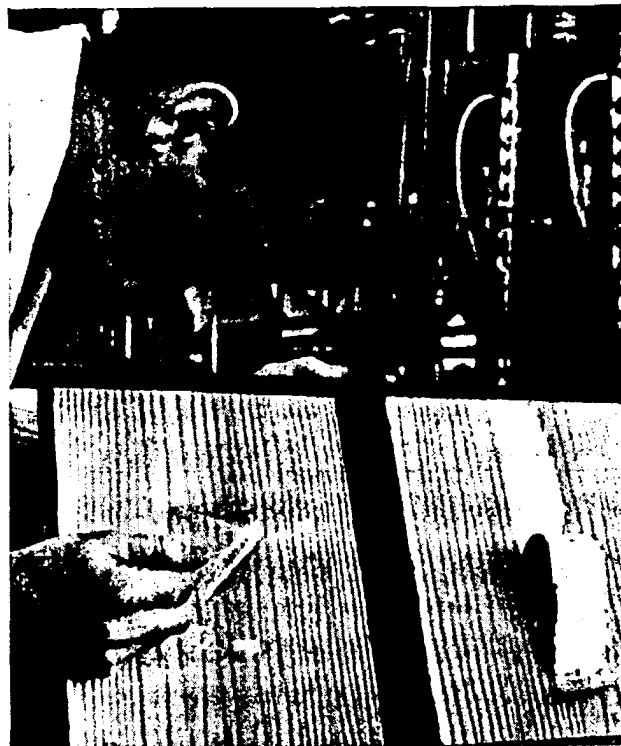
Prepared by the Vinyl Resins Laboratory of Celanese, this manual describes in detail the steps taken in development of a successful formulating method for producing paints with superior adherence to chalky and dirty surfaces. It is fully illustrated with test photographs and practical formulating information.



Celanese plastics and resins

Canadian Affiliate: Canadian Chemical Co., Limited, Montreal, Toronto, Vancouver.
Export Sales: Amcel Co., Inc., and Pan Amcel Co., Inc., 180 Madison Ave., N.Y. 16.

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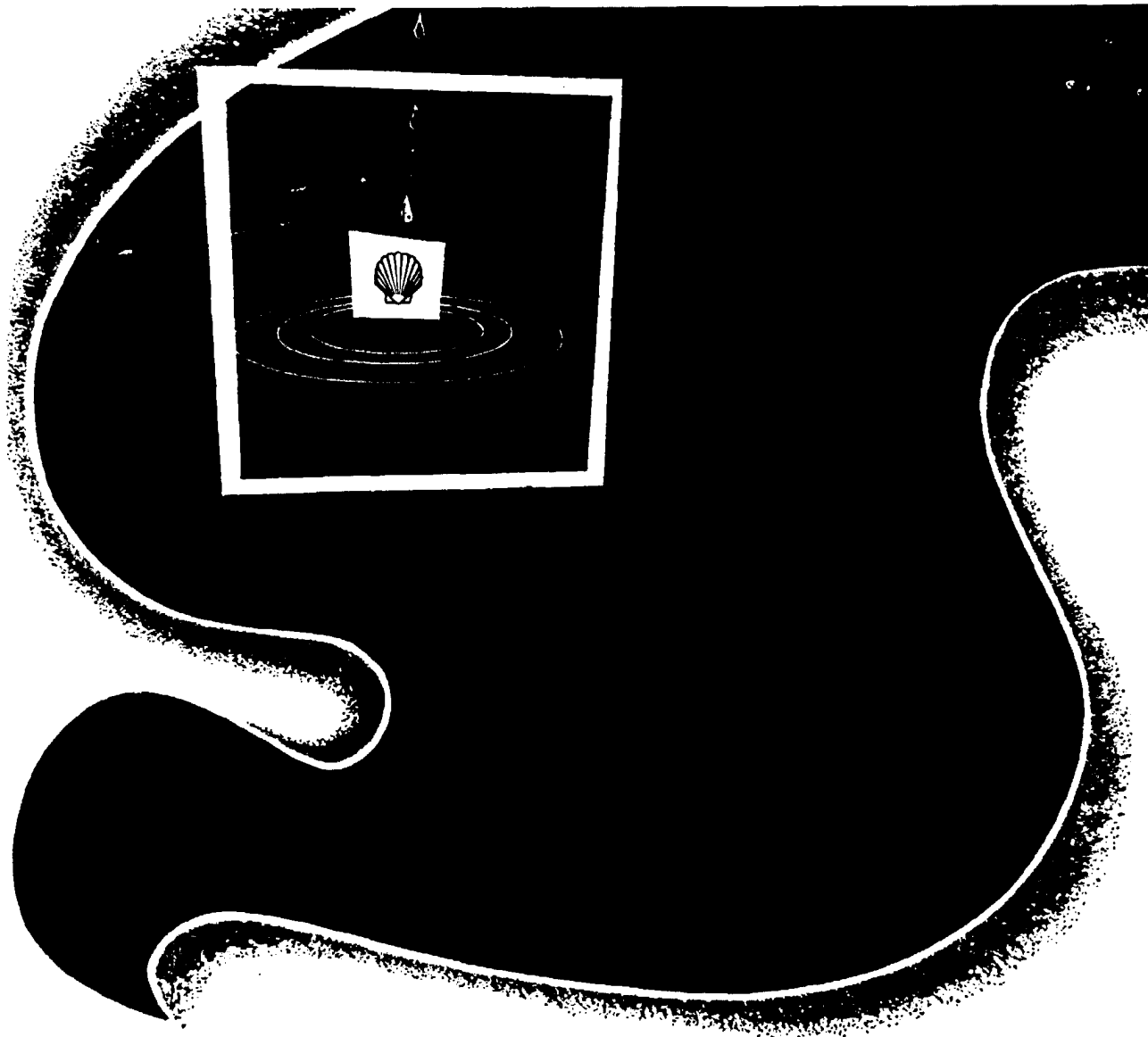
PVAc emulsion paint is tested by a technician at the Summit (N. J.) research laboratories. Pressure sensitive tape, when pulled from a test panel covered with conventional emulsion paint, removes the paint film. In the test panel at left, the new paint has penetrated the heavily chalked surface and adheres to the asbestos shingle beneath.

**Celanese Corporation of America, Plastics Division
Dept. 186-E 744 Broad Street, Newark 2, N. J.**

**Please send me free manual describing the formulating of
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