see that the numbers given in each table were given for special reason, *viz.*, to show the effect of time of heating, temperature, per cent rubber product present, etc., upon the final resins.

Indeed, we have tensile strength tests on our transparent almost water white materials which run higher than any of our published results (*i. e.*, from 5,000 to 6,200 lbs. per sq. in.), but since they have no bearing upon the scientific data given in our preliminary paper, we have not submitted them until now for publication.

There are many possible differences between our synthetic resins and the synthetic resins produced by the wet process which have not been mentioned in the Doctor's criticism; and it is to be carefully borne in mind that these very differences are the determining factors in many of the lines of industry in which our product is finding a market.

- (1) The rate of discoloration in daylight or direct sunlight.
- (2) The rate of disintegration in caustic or alkaline solutions.
- (3) The solubility or discoloration in alcohol and acetone solutions.
- (4) The effect of the lower fatty acids upon the resins, such as formic.
- (5) The ability of the resins to withstand shock as in rapid valve work, under high pressure.
- (6) The presence of free phenol in materials used for pharmaceutical apparatus.
- (7) The presence of water as a by-product in the final transformation of the resins, especially in large impregnated armatures.

These are only a few of the possible and real differences between our anhydrous resins and the wet process resins.

We cannot close this reply without pointing out another of the Doctor's errors. He concludes that our resins are identical with his resins, but this conclusion is offset by his statement that he obtained by the wet process (1) "An infusible end-product resins which showed *incomparably* better dielectric properties than what we obtain in making a material by means of dry phenol and dry hexamethylenetetramine as described by Dr. Redman and his collaborators."

Just how a material can be at one and the same time equal to itself and incomparably better than itself would seem to call for explanation.

It has been no part of our purpose to engage in controversy with a gentleman who has shown untiring industry in studying the work of the earlier inventors and putting to industrial uses the results of their labors supplemented by his own discoveries. Our effort, in our earlier paper, was to set forth something of the history of the art of producing synthetic resins, and it did not occur to us that in so doing we should give offense to our highly esteemed contemporary or furnish the animus for Dr. Baekeland's criticism to which we have here made reply.

L. V. REDMAN
A. J. WEITH
F. P. BROCK

AMBERIOD CHEMICAL PRODUCTS CO.
636-678 WEST 22ND ST., CHICAGO
February 16, 1914

VALUATION OF FLUORSPAR

Editor of the Journal of Industrial and Engineering Chemistry:

IN THIS JOURNAL, 4, 201 and 548, I published a quick method for the determination of the principal constituents of Fluorspar. This method is now used in our mine laboratory and has proved very satisfactory. In practical work, I have made some slight modifications, increasing thereby the accuracy of the results, so I believe the modifications may be of interest to some of my colleagues.

After dissolving the carbonates by diluted acetic acid, I evaporate to dryness, add 50 cc. water and heat to boiling to precipitate

the iron, dissolved by acetic acid, as basic acetate. Thereby the small amount of iron soluble in acetic acid is not calculated in the amount of calcium carbonate, as it would be by filtering off the acetic acid solution. Furthermore, the amount of calcium fluoride brought in solution is smaller, since the solubility of calcium fluoride in acetic acid is higher than in water: 50 cc. hot water dissolve 0.8 mg. calcium fluoride, while 50 cc. acetic acid (1:10) dissolve 10 mg. of calcium fluoride.

After volatilizing the silica, I decompose the metal oxides, as formerly, by digesting and evaporating the residue with hydrofluoric acid and a few drops of nitric acid. By this operation under certain conditions, some calcium nitrate can be formed and left undecomposed, which would cause an error because of the solubility of calcium hydroxide in the alkaline extraction solution. Also in fluorspar high in iron, some iron nitrate can be left undecomposed, which will change to a basic salt by evaporating, which basic salt is insoluble in the extraction solution.

Therefore, I repeat the evaporation with hydrofluoric acid in all cases in order to be sure that all nitrates are transformed into fluorides. Investigating the action of nitric acid on calcium fluoride, I evaporated one gram of pure crystallized fluorspar, finely ground, with different amounts of nitric acid and calculated the amount of decomposed Calcium Fluoride from the increase of weight as follows:

G. CaF ₂	Cc. HNO ₃ Sp. gr. 1.42	G. CaF ₂ decomposed
1	0.5	0.0034
1	1.0	0.0057
1	1.5	0.0089
1	2.0	0.0114
1	2.5	0.0131
1	3.0	0.0163

By digesting and evaporating these residues with 2 cc. hydrofluoric acid (50 per cent), I obtained the original weight of one gram fluorspar, showing that one evaporation with 2 cc. 50 per cent hydrofluoric acid is sufficient to decompose the calcium nitrate formed by evaporating one gram fluorspar with 3 cc. nitric acid (1.42).

Considering these results, I changed the method as follows: After volatilizing the silica and weighing the residue add 2 cc. hydrofluoric acid and 10 drops of nitric acid, cover the crucible with its lid and place on a moderately warm water bath thirty minutes; then remove the lid and evaporate to dryness, add 2 cc. hydrofluoric acid and evaporate again to dryness, etc., as described in my first paper.

Working in this manner, no calcium salt is dissolved by the extraction solution and only a small amount of calcium fluoride is washed out corresponding to the solubility of calcium fluoride in water.

The corrections I am using in this modified method, taking one gram of Fluorspar for analysis, are:

- (1) For loss in weight by treating with acetic acid, evaporating to dryness and boiling after the addition of 50 cc. water 0.0010 g.
 - (2) For loss in weight by treating with HgO and HF..... 0.0002 g.
 - (3) For loss in weight by treating with ammonium acetate.... 0.0010 g.
- 0.0022 g.

E. BIDTEL

LABORATORY FAIRVIEW FLUORSPAR & LEAD CO.
GOLCONDA, ILLINOIS
February 2, 1914

NOTE ON THE ELECTROLYTIC DETERMINATION OF COPPER

Editor of the Journal of Industrial and Engineering Chemistry:

In the electrolytic determination of copper from nitric acid solutions the deposit is very bright and adherent, if the correct acidity concentration conditions have been maintained. When the acid concentration is too low the film has a dull look and may

not be adherent. If the acid concentration is too high a long time will be required to completely deposit the metal, although the deposit will be very bright.

In those cases where it is very convenient to limit the amount of free acid in bringing the copper into solution in preparing for the electrolysis, and where the results of the analysis are needed in the shortest possible time for control work, this excess acidity can be very easily controlled by the addition of a little powdered sodium acetate to the solution.

In preparing the solution for electrolysis all the nitric acid can be used that is necessary to quickly bring into solution the copper, copper salts, or compounds containing copper. Then after the electrodes have been mounted, the current switched on, and current density adjusted, if the copper does not promptly start to plate out, a little sodium acetate dusted into the solution will fix the excess of nitric acid which is dissolving the copper film as fast as formed.

The change in the character and speed of deposition will be almost instantaneous and the deposit will be bright, adherent, and formed in the minimum of time. The treatment of the solution with an excess of sodium acetate at the end of a deposition in order to change the free nitric acid to sodium nitrate and thus enable the electrodes to be removed without previous washing has been recommended often and the action is the same in both cases, differing only in degree.

H. CLOUKEY

FOREST PRODUCTS LABORATORY
MADISON, WISCONSIN
December 27, 1913

REMARKS ON WHITE LEAD PAINT PUBLISHED IN 1810

Editor of the Journal of Industrial and Engineering Chemistry:

Mr. Frederick L. Hoffman, Statistician of the Prudential Insurance Company of America, has kindly sent me for perusal a rare volume of the *Memoirs of the Connecticut Academy of Arts and Sciences*, published in New Haven in 1810. On pages 135 and 136 occurs a letter from N. Webster, Jr., to Mr. Benjamin Silliman, Secretary of the Academy. I enclose a copy of this letter, thinking perhaps it might be interesting to the readers of the JOURNAL. It is interesting no note that in those days they spoke of the "new chemistry" in pretty much the same way that we do to-day. The "new chemistry" of Webster, however, is not very new now.

G. W. THOMPSON

129 YORK ST., BROOKLYN
January 27, 1914

ON THE DECOMPOSITION OF WHITE LEAD PAINT

To Mr. BENJAMIN SILLIMAN, Secretary of the Connecticut Academy of Arts and Sciences.

SIR,

It is well known, that a white paint, formed by mixing oil, and usually vegetable oil, with the white oxyd of lead, is very expensive, and not very durable. Within a few years after this paint is laid upon a building, it is observed that the oil has been separated from the lead, and the latter may be rubbed off with the hand, being reduced to a state in which it is easily pulverized. It is observable also, that the like paint on inside work, not exposed to water, is not liable to the same change. From these facts, it is probable that the oil, when exposed to water, undergoes a slow decomposition.

Oil is proved, by chemical analysis, to be composed of carbon, or pure charcoal, and hydrogen, or the base of inflammable air, in the proportion of nearly four parts of the former, with one of the latter. Now carbon has a very strong affinity for oxygen, one of the constituent elements of water. Is it not probable that the decomposition of the oil of paints is owing to that affinity—the carbon of the oil combining with the oxygen of water, and the hydrogen of the oil, being set free, escaping in the form

of gas? If so, the art of rendering the paint durable will consist in fixing the oil, or preventing this decomposition. This is undoubtedly a great desideratum in the arts. In the course of my scanty reading on subjects of this kind, I have found nothing satisfactory. The experiments of M. de Morveau, as related in a paper communicated to the Academy of Dijon, of which an extract is found in the Encyclopedia, were evidently made before the date of the new Chemistry. It is believed that the causes of the changes which paints undergo, and which he ascribes to phlogistic vapors, are now better understood than when he wrote; and it is desirable that the attention of the chemist, as well as the artist, may be invited to the subject.

If the funds of the Academy would permit, it might be well to offer a premium for the discovery of a substance which should fix the oil in white paints, without changing their color.

I am, Sir, respectfully, your obedient servant,

N. WEBSTER, JUN.

New-Haven, Oct. 30, 1804

FORTY-NINTH MEETING OF THE AMERICAN CHEMICAL SOCIETY, CINCINNATI, APRIL 7-10, 1914

A meeting of the American Chemical Society will be held in Cincinnati, Ohio, April 7th to 10th, inclusive, the beginning date having been changed from April 8th to April 7th since the announcement in the February Journal. A meeting of the Council will be held at the Hotel Sinton, at eight o'clock, P.M., on Monday evening, April 6th. The meetings of the Society will be held at the University of Cincinnati. The Hotel Sinton on the corner of Fourth and Vine Streets has been chosen as headquarters. Other hotels will be designated in the final program, which will be sent to all members who signify their intention of attending the meeting.

The following committees have been chosen to arrange the spring meeting:

F. W. Weissmann, *Chairman*.
Stephan J. Hauser, *Secretary*. Archibald Campbell, *Treasurer*.
CHAIRMAN OF SUB-COMMITTEES.
G. Farnham, *Transportation and Excursions*.
C. T. P. Fennel, *Publicity, Press and Printing*.
J. W. Ellms, *Reception*.
John Uri Lloyd, *Meeting Places*.
Mrs. J. W. Ellms, *Ladies' Reception*.
Richard Lord, *Entertainment*.
Lauder W. Jones, *Banquet*.
F. C. Broeman, *Smoker*.
Archibald Campbell, *Finance*.
F. O. Clements, *Reception at Dayton, O.*

All Divisions of the Society will meet, and the Water, Sewage, and Sanitation Section have announced that they are planning a special conference on Standard Methods of Water Analysis. As Cincinnati is near to some of our largest rubber manufacturing centers a large meeting of the Rubber Section is expected.

The Secretary of the Local Section announces the following detail:

"The Entertainment Committee is planning many interesting events, and special preparations are being made to provide entertainment for ladies, who may attend, at times when they cannot participate in the regular meetings. One particularly interesting feature will be the concert given by the Cincinnati Symphony Orchestra, under the direction of Ernst Kunwald, which has been arranged for Wednesday evening.

"The Transportation Committee has arranged a number of interesting visits to local industrial plants. It is a well known fact that Cincinnati has a very large variety of industries which are strictly chemical or very closely allied. This Committee has already arranged trips to the Filtration Plant, Proctor and Gamble's, the home of Crisco, Globe Soap Co., Diamalt Co., Andrew Steel Works, Boldt Glass Co., the New Cincinnati Hospital, the largest and most modern city hospital in the