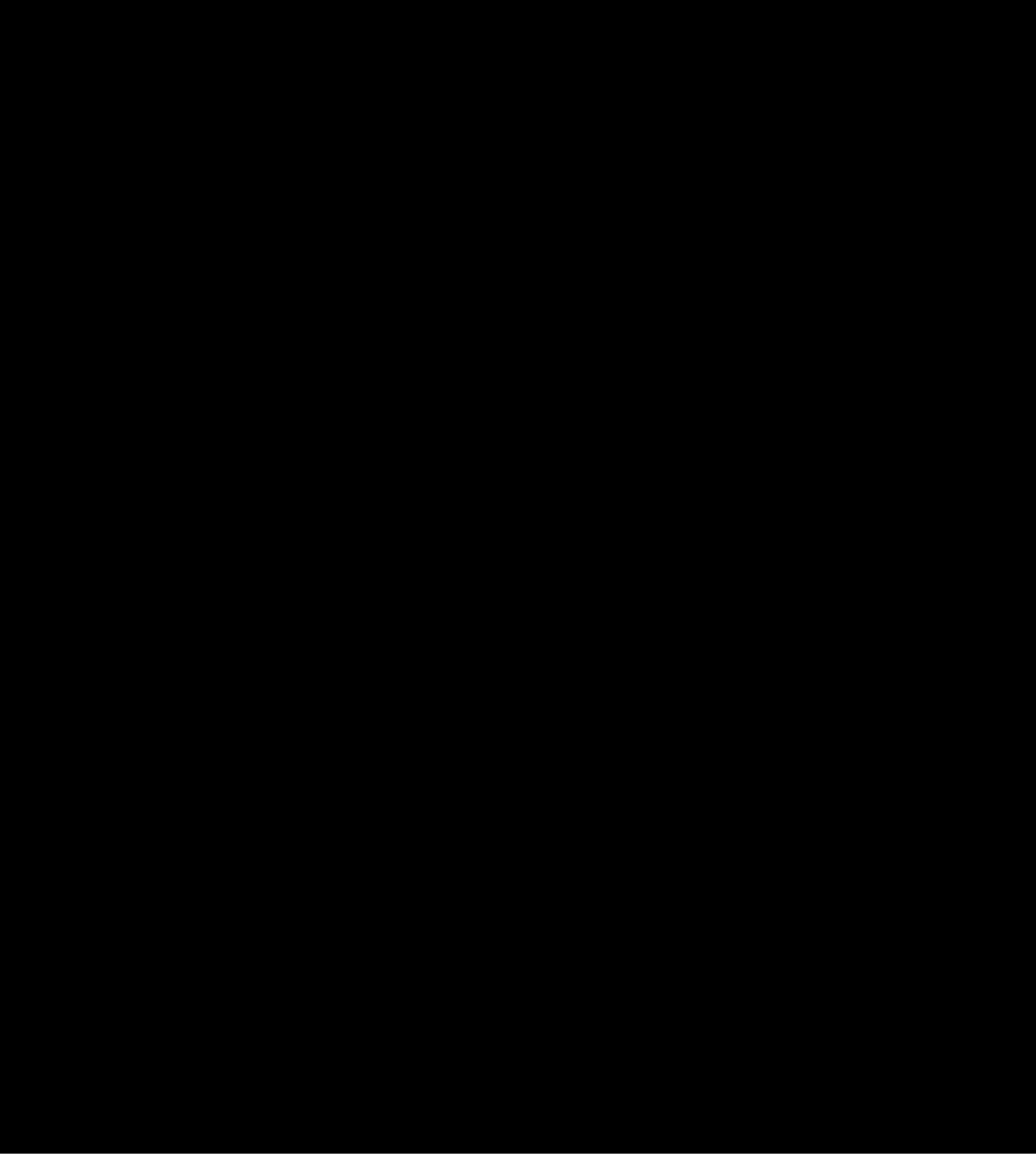




Paint Research
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#97 - Cont.

The rexes involved are:

Rx 471	SWP Gloss White	Card 75 versus Card 84
Rx 496	SWP Ivory	" 53 " " 60
Rx 478	SWP Geneva Cream	" 20 " " 27
Rx 465	SWP Colonial Yellow	" 23 " " 30
Rx 459	SWP Berkely Yellow	" 20 " " 27
Rx 458	SWP Plymouth Green	" 19 " " 26
Rx 474	SWP Chelsea Gray	" 23 " " 30
Rx 477	SWP Westchester Gray	" 19 " " 21

Exposures 22766-71 C, F were prepared during the month, all cedar bevel siding primed with Rx 450 Undercoater shaded gray. Exposure is at Chicago and Florida, vertical south only. The purpose of the test is to expose Card 1 of the following new SWP colors, all being production batches:

Rx 484	SWP Sierra Red
Rx 487	SWP Hibernia Green
Rx 488	SWP Auburn Brown
Rx 489	SWP Tyrone Yellow
Rx 490	SWP Terrace Green
Rx 498	SWP Uranian Blue

During August nine more house tests were started, bringing the total to 23 for the season up to September 1, with several more contemplated. House tests completed during the month:

1. R. Welge, 12532 S. 69th Court, Palos Heights, Ill.

This is a 15-year old house, 1-1/2 story. The siding was previously painted cedar shakes, all in good condition except for a few areas of rather serious erosion. The main test compares RB 5276 SWP Flat Flight Gray, regular formula, Cleveland production, against RB 5278, revised formula. Certain areas, mainly the south and west sides, were given two coats because of the previous erosion, while the balance of the house was given one coat. The owner, who did the painting, was very pleased with the SWP Flat, and the finished job looked very good. The occurrence of "shiner spots" was not extensive enough to mar the appearance. Spreading rates are not available at present.

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#97 - SWP

At the last Trade Sales Technical Board meeting, it was suggested that we determine what cost increase would result if SWP Gloss White were increased in opacity to equal that of Dutch Boy House Paint #110 Bright White. The label analysis on Dutch Boy was refigured to a 100 gallon formulation and the opacity was calculated and compared with that of SWP Gloss White Rx 471.

	<u>Holley Units</u>	<u>Contrast Ratio</u>
Rx 471 - Card 84	18,440	95%
Dutch Boy #110 Bright White	19,161	95.7%

The opacity of SWP Gloss White was increased to the same hiding as Dutch Boy, by the addition of twenty pounds titanium dioxide per 100 gallons. The yield was corrected by a reduction in inert. The increased hiding of the Proposed Formula 401 T has increased the raw material cost approximately 4-1/2¢ per gallon.

	<u>Holley Units</u>	<u>Contrast Ratio</u>
Proposed Formula OJ 401 T	19,660	96.1%

Work was continued on the formulation of a Fume and Mildew Resistant Gloss White. The two experimental Fume and Mildew Resistant Whites made with and without lead driers were checked for H₂S discoloration as suggested by the Trade Sales Technical Board. The formulation containing lead drier produced some darkening when exposed to H₂S fumes. The discoloration, due to the lead drier, was not bad, but as it was quite visible Mr. Holton suggested that the lead-free formulation 399 T be sent to Cleveland for distribution.

Exposures 22734-65 CS, CN, F were prepared during the month, all cedar bevel siding for exposure at Chicago north and south vertical and at Florida south only. The systems are in duplicate, in order to emphasize erosion characteristics, one set being primed with Rx 450 Undercoater of matching color, the other with Rx 450 of contrasting color. The purpose of the test is to compare new oils incorporated in SWP as of about July 1, 1955, against the oils previously used. The oils are:

<u>Old</u>	<u>New</u>
(2539) Bodied linseed	(2520) Vacuum-bodied linseed
(1521) Raw linseed	(1521) Raw linseed
(2702) Non-break linseed	(27 A 19) Reduced bodied linseed

Paint Research
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2. E. Clayton, 11658 S. Crawford Avenue, Mt. Greenwood

This house was rather questionable because of previous blistering and peeling, but repairs and good care in recent years seemed to minimize the risk. The siding is cedar. The entire house was primed with Rx 450 SWP Undercoater. Most of the house was then finished off with RB 5273, regular SWP Flat White from Cleveland. A small area on the south was finished with RB 5141, SWP Flat White with zinc oxide. We were particularly interested in the appearance of this job a few days after the finish coat was applied. Although the house looked good from a distance, close inspection disclosed quite serious "shiner" spots. These were generally in the area under the siding laps, where double-coating usually occurs, but were also found at many of the natural brush laps. No choice between the regular and special paints in this respect. The spreading rates were quite similar to what would be expected with regular SWP, 420 sq. ft. per gallon for Rx 450 and 485 for SWP Flat (unable to estimate the small special area).

3. S. Petroski, 515 Strongbow Trail, Porter, Ind.

We were interested in this house primarily because it was a small National Homes prefab house made with Douglas fir plywood siding. This type of siding has grooving which simulates vertical paneling. The house was only about six months old and the original single coat of stain had given very little protection. The characteristic wood-checking of fir was quite advanced. We felt that two coats of SWP on this difficult surface might do a job which would be a very good advertisement as compared to the stain jobs on the other houses in this development. The paints tested were:

RB 5141 SWP Flat White with zinc oxide, used as self-primed and also over Rx 450.

RB 5142 SWP Flat White without zinc oxide, used likewise.

The spreading rates, which would be expected to differ considerably from that on regular siding, were:

Rx 450, first coat only	- 320 sq. ft. per gallon
RB 5141, first coat	- 352 " " " "
RB 5141, second coat	- 430 " " " "
RB 5142, first coat	- 330 " " " "
RB 5142, second coat	- 440 " " " "

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#97 - Cont.

The owner reported that there were only a few "shiner spots" on the finished job, showing up only where he had been a little careless about "double-coating." He said all the paints brushed easily.

4. J. Meskis, 10824 S. Edbrooke Avenue, Chicago.

SWP Tint Base OJ 219 T, made with Wollastonite P-I as extender, was tested against a control of OJ 255 T regular on a small area, both shaded to #4016 Seminole Gray. Although the house was old, the siding and paint were in good condition and the job was done as one-coat work except for a minimum of spot-priming with Rx 450. The finished job looked very good, with no differences discernible between guide and test. The spreading rate of 337 sq. ft. per gallon, essentially same for each paint, was surprisingly low, even with a rather liberal allowance for porches, eaves and other areas difficult to estimate.

We also furnished paint for a test on the cement block foundation, about 4-1/2 feet high and consisting of old-style blocks which had never been painted. Two coats each of EM-1405 FVA emulsion and EM-1445 AC acrylic type were compared. This part of the job also required considerably more material than expected, indicating that the owner had a definite tendency to brush a heavy coat. He had no preference as to brushing and application properties.

The spreading rates on the blocks were:

	<u>First Coat</u>	<u>Second Coat</u>
EM-1405	180 sq. ft. per gal.	210 sq. ft. per gal.
EM-1445	185 " " "	240 " " "

5. N. Faucett, 10006 S. La Salle Street, Chicago

SWP One Coat House Paint White was tested on this house, which is a rather old bungalow with narrow bevel siding in good condition. Stock Rx 476, C 1585, was compared with a later batch, C 1785, the difference being that BI 72, a suspending agent, was added in the latter batch. As a precaution against factory error, a small area was painted with OJ 322 T, a laboratory batch using the above agent. The owner, who did the painting, stated that he could see no appreciable differences in working qualities. After about two weeks, OJ 322 T looked just slightly less glossy than the others and seemed to have a slight yellow cast. On account of dormers and extra trim work which was done at the same time as the main walls (contrary to our instructions), we were unable to get reliable spreading rate figures.

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#97 - Cont.

6. A. Wieringa, 18704 Highland Avenue, Homewood, Illinois

This house was painted as a test when new in 1953, using SWP Plymouth Green, with an area of Intermix (low PVC) on the rear as the major comparison. The owner wished to repaint largely because of the appearance of rusty nail-heads over a considerable area. We wanted to preserve the previous test, so the rear side was not repainted. Incidentally, we noted that the Intermix area at two years was distinctly preferable to the regular paint area, partly because of better color (though this was somewhat counteracted by more dirt), and partly because the Intermix seemed to prevent the nail-head rusting almost completely.

We furnished only one paint, RB 5255 SWP Flat Plymouth Green, regular. Although it was probably not seriously needed, the owner put on two coats rather than just one. He stated that it dried unusually fast. Considering this, there were surprisingly few "shiner spots." By careful work, he avoided them entirely under the siding laps, and they show up only on a few places where it was necessary to leave an "edge" and work back into it later.

The spreading rate (overall, figuring both coats) was rather high, about 560 sq. ft. per gallon.

7. H. Bateman, 3916 Sunset Avenue, Markham, Ill.

This little house, second repainting in the five years since it was built, was our first opportunity this season to test a competitive paint system. About 1/4 of the house was done with Sears H. P. Undercoat plus Sears #143 Outside White, against our stock Rx 450--Rx 471 on the balance of the house. The spreading rates, rather closely calculated, were:

Sears Undercoat	447 sq. ft. per gallon
Sears finish coat	470 " " "
Rx 450	420 " " "
Rx 471	485 " " "

The owner was very well pleased with the SWP in all respects. The brushing of the Sears paint, especially finish coat, was definitely "sticky." The Sears primer dried to a very definite yellow cast, and even the finish coat is slightly yellowish. It is also less glossy than Rx 471 and shows much more prominent brush marks.

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#97 - SWP

An investigation is under way to determine the reason for the reduction in viscosity of SWP after several months storage. The various plants were requested to check the viscosity of their production on SWP Gloss White made during the past several months and report their findings to A. B. Holton. It was found that the percentage of low consistency SWP production varied with each plant depending on the passing viscosity at time of manufacture, the variations in reactivity of the oils, moisture content of pigments, etc. For an immediate solution Mr. Holton requested all factories to add approximately 25 pounds additional inert to the formula and increase the initial passing viscosity to 35 $\pm$ 2 seconds on the #3 S-W cup.

In connection with this problem the Chicago plant has manufactured six batches of SWP, using various suspending agents, to study stability of viscosity on storage. The paints are to be checked for package condition after 3, 6, 12 and 18 months storage. Test data are recorded in the following table.

Suspending Agents in Rx 471 SWP Gloss White						
Date	C 1745B	C 1755	C 1785	C 1795A	C 1795	C 1805
Suspending Agent per 100 Gallons	3 lb. Lecithin	6 lb. Lecithin	4 lb. Calcium Stearate	1 gal. BI 72	1 lb. Bentone 34	No Agent
Additions or Deductions	- 1% (151)	- 1% (151) + 1 $\frac{1}{2}$ gal. (25011) per 2000 gal.	- 1% (151)	No Additions	+ 3/4% (151)	+ 2% (145)
High Shear Poises	2.6	3.0	2.7	2.6	2.8	3.0
T Wt./gal.	13.87	13.87	13.87	13.87	13.87	13.87
A Wt./gal.	13.97	13.84	14.03	13.83	13.98	13.69
Viscosity #3						
Fresh	26"	30"	28"	29.8"	33"	34"
24 hr.	25.4	29.6	27.6	31.4	31.6	--
6 Days	25.8	31.6	29.2	31.6	34.6	39.8
2 Weeks	25.6	33.4	29.4	31.2	33.6	39.2
3 Weeks	25.6	35.0	29.2	31.2	33.8	37.2
4 Weeks	24.8	32.0	28.6	30.2	32.6	36

(151) Mineral Spirits High Flash (145) Mineral Spirits
(25 C 11) Bodied Reduced Linseed

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#97 - Cont.

The Sales Department has shown interest in the development of a Fume and Mildew Resistant White for Trade Sales. Some time was devoted to the development of a product of this type. Two formulations were submitted with and without lead drier in the vehicle. The paints are to be checked for H₂S discoloration and samples will then be placed in storage to be checked for drying after several months. It was decided that one of these formulas will be distributed within the near future depending on the results of the H₂S tests.

	Raw Material Costs		
	Pigment	Vehicle	Total
OJ 211T - SWP Fume and Mildew Resistant White (Lead Free Driers)	\$95.15	\$83.03	\$178.18
OJ 365T - SWP Fume and Mildew Resistant White (Using Lead Drier)	96.39	76.71	173.10
Lucas Fume and Mildew White TG 252	97.74	79.30	177.04
SWP Gloss White Rx 471 Card 84	94.19	70.91	165.10

During July, 11 more house tests were begun, making a total of 15 for the year up to August 1. Several others will be started as soon as the paints are ready. Three house tests were completed during July.

1. H. De Rossi, 14500 Minerva Street, Dolton, Illinois.

This is a new frame house with 8" redwood bevel siding, finished in January, but with the siding on and primed with Rx 450 Undercoater in November. We provided Rx 471, C1435, SWP Gloss White to be used as a finish coat and compared with Rx 471, C1785, SWP One Coat White. The owner felt that the Rx 476 brushed a little harder (this was the first batch of Rx 476 reformulated to match the improved brushing of Rx 471). He thought it tended to leave more brush-marks, but close examination showed that both flowed out very well. The workmanship was only fair, but for opacity and general uniformity the Rx 476 area seemed to be a little better. The spreading rates were: 390 sq. ft. per gallon for Rx 476, on areas which could be estimated quite accurately, and 490 for Rx 471, the area including much more trim work and more difficult to estimate.

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#97 - Cont.

2. M. Cummings, 14618 Woodlawn Ave., Dolton, Illinois.

This was a new house, a small bungalow sided with cedar shakes. The shakes were a light gray and were painted with such an inferior system that considerable fading and spottiness, and even some erosion, had shown up in less than 8 months (mostly winter). We supplied SWP Flat Flight Gray on two formulas, RB 5234 zincless type and RB 5247 zinc containing. Two-coat self-primed work was required with each. The owner was quite pleased with the general workability and with the finished appearance. We noticed, however, that there was a certain lack of uniformity of color which seemed to be associated with slight irregularities in sheen (not necessarily double-coating or "shiner spots," of which there were relatively few). Furthermore, the lowest sheen and lightest color seemed to be on small areas showing bubbles or a frothing effect on at least the topcoat. We do not have an exact measurement for the two separate coats, but considering both coats the spreading rate was rather low, about 290 sq. ft. per gallon per coat; with no difference between the two formulas.

3. C. R. Jones, Cambridge Road, Flossmoor, Illinois.

This house test is not actually finished, on account of a very recent unfortunate encounter with dew-flattening on one side and subsequent halting of the painting on the last side pending our further instructions. However, since spreading rates and other final data are not of great importance, a general write-up can be presented. This is a rather large 2-story frame house, getting its first repainting at 4-1/2 years. The general condition was good, with a few minor spots of peeling. We supplied Rx 450 Undercoater for the first coat, all regular, and also regular Rx 471 SWP Gloss White for a control area. The major part of the house was finished with OJ 213T, Rx 471 using Wollastonite. The owner, who did the painting, noticed no differences of significance in the handling of these paints, and was very pleased with the results, at least up until the attack by the dew. This was a rather unusual case, in that the dew-flattened area was painted almost entirely between the hours of noon and 4:00 PM. A vertical-paneled gable on the front was painted with SWP Flat White, RB 5248, over Rx 450. This looked very good, but on close inspection at a grazing angle a few "shiners" could be seen. This paint appears less bright and somewhat less white than adjacent Rx 471.

On August 3, we examined 2 additional house tests in process of being painted, our interest being mainly in the occurrence of "shiner spots" due to double-coating. Although the general appearance was good in both cases, there were a certain number of "shiners," more or less conspicuous according to the care used in painting.

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#97 - SWP

The Vegetable Products Research Laboratory has submitted two experimental oils, MB 9264 and MB 9065, to be evaluated in SWP. MB 9264 - (1527) is a vacuum bodied, acid refined and clay bleached linseed oil having approximately 28 - 30 seconds G-H tube viscosity. MB-9065 is a linseed oil with a color of 9 + (non-staining), Acid Value 2.1, Viscosity B and specific gravity of 0.938. MB-9065 was used in conjunction with MB 9264 and evaluated for color, wetting, brushing, flow and gloss in SWP. The paint was compared with regular SWP made with (1521) raw linseed and (25 A 23) vacuum bodied linseed. In both cases the paints contained the standard amount of (27 A 19) maleic treated linseed. The object of this evaluation was to determine if the darker color of the MB 9264 could be compensated for by the lighter color and less staining properties of MB 9065.

The results of the tests indicated that the paint made with MB 9065 and MB 9264 is superior in color but more sticky in brushing than standard. This combination of oils is not satisfactory for SWP. Previous tests with MB 9264 as a replacement for (25 A 22) indicated that it produced slightly higher viscosity in SWP but otherwise appeared to be satisfactory. Test data appeared in the September, 1954 report.

As described in the October, 1954 report, MB 9065 previously was tested as a replacement for (1521) raw linseed oil. The resulting paint was slightly higher in initial viscosity, equivalent in brushing and flow and appeared to be slightly whiter in the package than regular SWP made with (1521). However, when brushed out, the paint made with regular (1521) bleached out to an equivalent brightness in a matter of one or two hours. This work will be repeated with results to appear in the April report.

Exposures 14855-60 and 15318-21 F, C were studied during the month, the former at approximately 4 years' exposure and the latter at 3 years, both Florida vertical south and Chicago north and south. All are cedar bevel siding, primed with Rx 450 Undercoater of contrasting shade, to emphasize erosion. The older series covers Persolite P-IVR as extender, substituted for 20-6221 dry magnesium silicate both at equal weight and equal volume, and both in Rx 471 SWP Gloss White and in Rx 465 SWP Colonial Yellow. The later series is similar, but Persolite 4-PVR is used (a later sample of smaller particle size), and only Rx 471 is involved. The Persolite showed some advantage in color retention in the tints, at least for about two years, but this was counterbalanced by a greater dirt collection tendency. Likewise, in the whites slightly poorer clean-up counterbalances a slightly retarded erosion rate. We conclude that Persolite, with no particular choice between the two samples, is satisfactory for SWP use but not of any great interest unless its use were indicated by price considerations.

0007-SWP-044124

0007-SWP-000113494

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Exposures 19035-19138 C, F, K, the 1953 House Paint Study, were examined recently. The several purposes may be outlined as follows:

- a. To evaluate several pigment variations of Rx 471 SWP Gloss White, mainly to improve brushing.
- b. To evaluate similar changes in Rx 436 SWP Fume Resisting White.
- c. To evaluate similar changes in Rx 473 SWP Tinting White.
- d. To test the possibilities of all the above formulations as tints, both in Colonial Yellow and Chelsea Gray shades.
- e. To test the effectiveness of 1/2 gallon of Super Ad-It as a mildew preventive. Therefore, all the above paints are repeated with this addition, except that this was not done with Chelsea Gray.
- f. To test 9 samples of Rx 471 submitted by Cleveland Technical Service as of August, 1953.
- g. To evaluate 11 purchased samples of white house paint from major competitors.

A total of 368 cedar siding panels were prepared, equally divided among four exposure locations. The present report covers the first year's exposure - Chicago north and south vertical, Florida south and Coffeyville south. All panels are cedar bevel siding primed with Rx 450 Undercoater. The bulk of the results so far on the more routine variations of the three rexes cited (a through e, above) do not justify the time and space required to present details of either composition or performance. Briefly, the variations in all three follow about the same pattern:

1. A regular formula (guide), all linseed vehicle.
2. Modification of pigment by introducing mica and Titanox AA, and of vehicle by using essentially equal parts of (1521) raw linseed oil, (2702) non-break and (2556) reduced bodied linseed.
3. One Coat House Paint type vehicle, featuring 5 gallons of (3870) alkyd and 20 gallons of (2702). Not used with Rx 436.
4. "Modified vehicle" as in 2, but adding 4 gallons of alkyd.

0007-SWP-044125

0007-SWP-000113495

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5. Introducing 10 gallons of MB 2806 maleic treated linseed, the balance being raw linseed and non-break.
6. All paints were prepared in five ways - as white, white with 1/2 gallon of Super Ad-It, Colonial Yellow, same with Super Ad-It, and Chelsea Gray.

The results of the above SWP variations followed quite closely what would be expected, and may be stated very briefly:

All whites performed about the same, allowing for location, except that the Rx 473 tests, being very slow in chalking, were dirty and showed considerable mildew. None of the many other minor differences, mainly in dirt collection, indicated any pattern favorable or unfavorable to any one of the five formula variations. The Rx 436 group seemed a little cleaner and whiter than Rx 471.

There were no appreciable differences due to Super Ad-It. Consequently, many of these tests were eliminated. The tints showed somewhat more differences, but still they were essentially all traceable either to the general formula type, to the shade or to the location. None of the five experimental changes resulted in any consistent trend. The Rx 473 tints looked good in color retention, but showed considerable mildew at Florida and some microscopic checking. The Rx 471 group was clearly unsatisfactory because of chalk-mask fading, though better in mildew resistance. The Rx 436 group carried this trend even further, with extreme chalk-mask.

Referring to group f above, the Cleveland Technical Service samples, no significant differences in performance from that of regular Rx 471 were found. These nine paints covered rather minor revisions of Rx 471, coded PT 126 H, H 3, HG, G, I, L, M and N and RTV 724. The main changes involved were (a) introduction of 6-1/2 gallons of (25 A 4) OKO M-36 bodied linseed, (b) 8223 dry micromilled talc in place of Nytal 300 and (c) use of 6805 carbonate white lead, with a minimum of lead as co-fumed leaded zinc.

Following are the general results of exposures of competitive outside whites in this series. All are two coat work using Rx 450 Undercoater. Since there is no film failure and the Florida tests show the only mildew, the Florida tests are the main basis of the results cited:

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Rx 471 - Good, clean, very little mildew.
Devos #547 - Low chalk; dirty and serious mildew.
Dutch Boy #110 - Good; only one looking cleaner and better than 471.
du Pont #40 - Rather low chalk; some dirt and mildew.
Pittsburgh #1-54 - Low chalk; serious dirt and heavy mildew;
poorest except for the white leads.
Sears #145 - Good; not quite as clean as 471 in most tests.
Glidden #1800 - Rather low chalk; some dirt and mildew.
Moore's #100 - As clean as 471, but looks "thin."
Pratt and Lambert #300 - Low chalk; dirty and serious mildew.
Dutch Boy W.L. #116 - Poorest; extreme mildew and alligating.
Scotch Laddie Titanized W. L. - Bad dirt, yellow cast;
no mildew or checking.
S-W White Lead - Extreme alligating, but less dirt than Dutch Boy.
(using 1st and 3rd coat reductions as per label)

Exposures 19139-19233 C, F, K, a large series prepared primarily to study possibilities of reduction in the number of white house paint rexes stocked and sold, were studied during the month. Particular attention is given to Rx 471 SWP Gloss White, Rx 436 SWP Fume Resistant and Rx 473 SWP Tinting White. Since TiO_2 differences represent the major variation, several compromises are attempted.

380 panels were exposed in this series, equally divided among four locations - Florida, Coffeyville, Chicago north and Chicago south. All are cedar bevel siding primed with Rx 450 Undercoater. Nineteen basic paints were tested in five ways: (1) as is, white, (2) plus 1/2 gallon Super Ad-It, (3) as is but shaded to Colonial Yellow, (4) shaded and plus Super Ad-It and (5) shaded to Chelsea Gray. Time of exposure is essentially one year at all locations. Further details of this extensive series may be obtained from a regular report dated March 25, 1955.

0007-SWP-044127

0007-SWP-000113497

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Of the nineteen basic paints, three are regulars of Rx 471, Rx 456 and Rx 473, one is the established formula of the low PVC Inter-Mix White RB 4448 and one is a 50/50 blend of Rx 471 - Rx 473. One in each type formula (four in all) involve the addition of mica. Several involve the so-called "One Coat Vehicle," 20 gallons of (2702) non-break linseed oil and 5 gallons of (5870) alkyd. One test is a blend of Rx 471-473 with "One Coat Vehicle," another is a blend with mica. The essential TiO_2 variations are:

1. In Rx 471, the regular with 175 pounds 6680 dry RCRT/100 lb. 6680 dry FF TiO_2 versus same content of RCRT but 50 lb. 6603 dry AA TiO_2 for half of 6800 dry versus 6800/6605 dry with RCRT replaced by 6685 dry RC.
2. In Rx 456, the regular with 100 pounds each of 6600/6603 versus all 6605 versus 175 pounds 6680 with 50 pounds each of 6600 and 6603.
3. In Rx 473, regular with 350 pounds 6685 dry RC; not varied as to TiO_2 .
4. In Intermix White, 175 pounds 6650 dry R-610 is the only active pigment in the regular. No TiO_2 changes are made, but in RB 4449 100 pounds of mica is added and in RB 4450 the TiO_2 is cut to 155 pounds and 75 pounds of 6801 dry basic silicate white lead is brought in.

Many of the same general impressions were gathered from this series as from series 19035-19158. Super Ad-It showed no effect and many of the panels were retired. Rx 471 shaded showed bad chalk-masking, Rx 456 even more so, Rx 473 showed poor clean-up as a white and Intermix showed extreme dirt and mildew. To date none of the changes involving "one coat vehicle" or use of mica, or in fact any changes other than TiO_2 content, have shown any notable differences in performance. The significant results involving the TiO_2 changes and other major variations are:

1. Whites in Rx 471 very slightly dirtier due to bringing in 50 pounds Titanox AA, noticeably dirtier with Titanox RC. Tints do not show up this increased dirt. As to color retention, the changes are noticeably better, especially with RC, but not equally so in Gray and Yellow, and the best tint retention does not approach that of Rx 473.

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0007-SWP-000113498

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2. Whites in Rx 436 are cleanest of the series, and there is only very slightly more dirt due to the use of AA only or of RCHT/AA/FF. The color retention is poor, the only improvement being a very slight one with AA.
3. No choice in the whites based on Rx 473. The tints show the most checking of the series, little affected so far by mica. Since there are no routine TiO_2 changes in this rex, we mention the blends of Rx 473-471 under this category. These showed no differences due to the "one coat vehicle" or mica changes. The whites varied more with location than other whites. They averaged as clean as Rx 471, but showed a little less chalking and more mildew at Florida. The tints showed considerably more fading than Rx 473, especially in Gray, with somewhat less checking, dirt and mildew. In general, the tints are not satisfactory either as to color or clean-up.
4. The Intermix formula as white carries so much dirt (and even more mildew at Florida) that it is very unsatisfactory in spite of its gloss retention. About the same may be said of the tints, which are good only in color and gloss. The changes do not seem to have had any significant effect so far.

Exposures 22119-38 C, F were prepared during the month, all cedar bevel siding for exposure at Chicago and Florida, vertical south. These are half-and-half panels carrying various shades made with regular oil colors versus the same made with the new "universal" tinting base. The basic paints also offer a comparison - Rx 473 SWP Tinting White against the low PVC Intermix White. All tests are one coat over Rx 450 Undercoater shaded gray.

Exposures 22226-35 CS, CN, F were prepared during the month, all cedar bevel siding for exposure at Florida vertical south and at Chicago north and south. In this series Rx 471 SWP Gloss White Card 80 is tested against three variations:

- a. 6600 dry anatase TiO_2 , 6840 dry 35/65 leaded zinc and 6232 dry Nytal 300, all treated with silicones by Linde Air Products Company, their "A" treatment using methyl oils LM-3 and L-45.
- b. Same as control, but replacing anatase with R 200 rutile.
- c. Preceding paint with R 200, and other pigments as in (a), treated with silicones.

These tests are made both over Rx 450 Undercoater and self-primed.

0007-SWP-044129

0007-SWP-000113499

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#97 - SWP

The suggested formulation OJ 211 T for SWP Fume and Mildew Resisting Gloss White, referred to in the May monthly report, has been reported to be too high in raw material cost by our Sales Department. Therefore, an effort was made to lower the cost. Our latest suggested revision 324 T is approximately 4-3/4¢ lower in raw material. The raw material cost compared with the Lucas Fume and Mildew Resisting White and SWP Gloss White are as follows:

	<u>Pigment</u>	<u>Vehicle</u>	<u>Total</u>
SWP Gloss White Rx 471 Card 84	\$94.19	\$70.91	\$165.10
Lucas Fume and Mildew White TG 252	97.74	79.30	177.04
SWP Fume and Mildew Resisting White 324 T	95.77	76.71	172.48

Chicago Varnish-Resin Laboratory prepared two variations of (27 A 19), the maleated bodied linseed oil used in SWP. The first is CTV 9064, heat bodied to 65 seconds and then blown for 20 hours to 2 minutes 17 seconds body. At 69.5% solids it has a viscosity of R-, acid value 6.5 and color 7-8. The second is CTV 9070, heat bodied to 74 seconds and blown for 52 hours to 2 minutes 40 seconds body. At 69.9% solids it has a viscosity of U, acid value 7.2 and color 9. The stock sample of (27 A 19) used for comparison had a viscosity of S, acid value 8.3 and color 11. Laboratory batches of SWP Gloss White made with these three oils compared as follows:

SWP Gloss White Rx 471 Card 84

<u>Paint</u>	<u>Oil Tested</u>	<u>Brushing</u>	<u>Flow</u>	<u>Gloss</u>	<u>High Shear</u>	<u>Viscosities - #3</u>			
						<u>Fresh</u>	<u>24 Hr.</u>	<u>9 Days</u>	<u>17 Days</u>
308 T	(27A19) Stock	Very good	Good	Good	2.7	34.6"	43.8"	40.6"	38"
309 T	CTV 9070	Very good	Very good	Good +	2.5	33"	42.4"	31.6"	28.4"
310 T	CTV 9064	Very good	Good	Good +	2.4	27.8"	31.4"	25.6"	25.6"

For the time being, it was felt that neither special oil had any important advantage over regular (27 A 19).

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Exposures 22564-87 C, CB were prepared during the month, a special series in which one set of panels was placed on regular Chicago vertical south exposure and a duplicate set on the blister fence recently put into use at the U.S. 30 Test Station. The blister fence is similar to that used at the old farm, a 2 x 4" framework similar to the regular fences in size and shape but facing east-west. Instead of the nailed-on continuous siding used previously at the old farm, we are trying regular 3-foot test panels mounted the same as on the regular fences. The enclosed stud spaces are then filled with sawdust and kept wet by pouring in water at the top.

In this series, half of the panels are regular cedar siding, but the main feature of the test is that the other half consists of pressed paper siding, 1/4" x 8" flat panels developed by the makers of "Upson Board." The paint systems used are six systems thought to be the most likely prospects for use on a pressed paper siding if it proves practical. The systems are:

1. Rx 450 SWP Undercoater - Rx 471 SWP Gloss White.
2. Rx 471 as 2 coats self-primed.
3. Rx 450 plus Intermix White (low PVC).
4. Intermix as 2 coats self-primed.
5. PVA emulsion primer EM 1354 plus Rx 471.
6. Acrylic emulsion primer EM 1355 plus Rx 471.

A further explanation of the 1955 House Test Program may be of interest at this time. Toward the end of May a plant bulletin board announcement was made soliciting employees' and their relatives' houses for test jobs. Cedar shakes, asbestos shingles, concrete and stucco structures were particularly requested. By the end of June over 75 requests were received. About half have been investigated and about 12 are approved to date and are either started or ready to be started.

A new frame garage was used for a test of Rx 416 SWP Ardmore Green. The location is 14622 Woodlawn Avenue, Dolton, Illinois; the owner Mrs. M. Severson. The garage is fir drop siding, with double car doors on the west side, all sides being open to the weather. The entire structure was first primed with regular Rx 450 SWP Undercoater shaded light green. The major part then received a finish coat of Rx 416, C 125, new formula. One door was finished with a sample of the old formula, date C 2734. The finished job looked very good. It was a little difficult to choose between the two on the door surfaces, but the new formula looked more uniform in flow and gloss, also slightly higher in gloss.

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A second test has been completed at the home of S. Ohlund, Porter, Indiana. This is a frame house and the test is of Rx 476 One Coat House Paint White, old formula versus the proposed new formula incorporating the improved brushing properties developed for Rx 471 about a year ago. Because of the remote location and the temporary absence of the owner, full details are not available at present. Mr. Ohlund reported that the painters hired to do the work were very pleased with the new Rx 476.

Two further tests are nearly completed. Both may be of immediate interest although final results are not available on either. A stucco house finished four years ago with Thoroseal Cement paint (white), the property of P. Carollo near Chicago Heights, provided an unusually good opportunity for testing stucco, concrete and masonry finishes. We supplied Rx 900 SCM Finish Winter White, to be used two coats and compared with EM-1362 acrylic emulsion stucco paint.

The other test now nearly completed deserves mention mainly because of the past history of the house. It is the property of Mrs. A. Henderson in Lansing, Illinois. This is a frame house with 8" aluminum siding. Some six months after it was built in 1948, we supplied paints for the first painting as a test. A large portion of the house was done with the regular two coat SWP recommendation, Rx 450 Undercoater - Rx 471 Gloss White. Because of difficulty in brushing Rx 450 on the aluminum, we also tried a primer having the pigmentation of Rx 450 (zinc-containing at that time) but with brushing properties more similar to Rx 471. Another area received a fast dry zinc chromate primer followed by Rx 450 - Rx 471. The job looked remarkably good for seven years. In fact, the only obvious shortcomings in appearance were (a) the growth of mildew on a shaded area and (b) show-through of the yellow chromate primer, although this was serious only where tree branches rubbed off the top coats. On the basis of this house, which is quite well confirmed by various panel tests of several years ago, we are quite convinced that Rx 450 has excellent adhesion to aluminum and that no special primer is needed. The repaint job is being done with Rx 476 One Coat White, part of it carrying a fungicide.

Sears Roebuck Central Laboratories submitted samples of paints for evaluation on the high shear viscometer. Included in the series was our Rx 471 SWP Gloss White date C 1225. In the evaluation it was of interest that none of the Sears materials were equal to SWP for ease of brushing. Their one coat white was the best of their samples with others of the series being definitely poor. High shear viscosities of the Sears materials ranged between 2.5 and 4.7 poises. The 2.5 poise material contained volatile thinners which made this low high shear value somewhat misleading when compared with practical paint application. Chicago sample C 1225 of Rx 471 was found to be 1.6 poises. This was found below standard high shear viscosity and brushed too easily on practical paint-outs. A control sample of Rx 471 at 2.5 poises showed standard brushing qualities.

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The Trade Sales Quality Control Laboratory has reported excessive body on two production batches of SWP Mildew Resisting Gloss White Rx 472 dated T 85 and T 465. This product has always shown a tendency to afterbody on storage. To correct this abnormal tendency, steps have been taken to reformulate Rx 472 on a more stable basis.

Dallas has reported that their next production on Rx 472 will be made using 8 pounds (19-T-1) an 80% lecithin in xylene solution as a replacement for the 4 pounds of calcium stearate 846 dry to improve stability. Paints were also made in our laboratory with 25 pounds and 50 pounds of #10 Whiting which was used as a replacement for a portion of the Nylal 300 6232 to lower the initial viscosity.

Paints containing the lecithin are all lower in viscosity and have improved stability on storage. The use of lecithin produced some color or staining which bleached out after the paint had been exposed to light for a few hours. The introduction of the lecithin also appeared to improve the initial gloss. The viscosities of the experimental paints are as follows:

SWP Mildew Resisting Gloss White Rx 472

Paint	Inerts Poundage			846 Calcium Stearate	(19 T1) Lecithin Solution	Viscosity #3 Orifice		
	62 C 2 Mica	6232 Nylal 300	6301 #10 Whit- ing			Fresh	24 Hr.	6 Days
84 T Repeat 659 S	65#	150#	-	4#	-	27.8"	40.8"	73.4"
82 T	65	125	25	4	-	25.6	32.2	61.8
83 T	65	100	50	4	-	29.4	39.4	64.4
104 T	65	150	-	-	8#	24.6	27.8	34.4
103 T	65	125	25	-	8#	23.2	26.4	27
89 T	65	100	50	-	8#	23.2	26.4	27

Exposures 16158-85 F, C were examined during the month. The purpose was to evaluate laminar rubber grade ground oyster-shells, from the Laminar Chemical Corporation in comparison with 6252 dry AA mica, to which it is similar in particle shape. Both are used at 7% by weight in Rx 471 SWP Gloss White, Card 62, the regular guide paint being made with all inert as 6221 dry magnesium silicate. Tests were made on cedar bevel siding using Rx 450 Undercoater, and also on repaint wood, one coat only. Retired at 36 months Florida vertical south and at 44 months Chicago, north and south.

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At one year there was no choice among these tests at any location, and essentially the same was true at two years. The Florida tests at 36 months show the Laminar sample as a little more dirty than the others. There is considerable failure on the repaint work, mostly due to peeling caused by the attack of moisture at the edges. Because the guides are 2-coat work, we cannot be sure of the significance of test differences, but it seems that both the mica and Laminar samples, especially the latter, are resisting this failure better than the regular. The Chicago tests show both Laminar and mica samples as fully equal to the regular, no failure and normal appearance on the two coat work. On the one coat repaint work there is considerable failure, mostly erosion, and the Laminar sample seems to have a slight edge.

Exposures 16472-82 F, C were studied during the month. The purpose was to evaluate Ti-Pure LW, a water-dispersible grade of anatase TiO_2 offered by du Pont and R-300, similar but rutile type, in Rx 471 SWP Gloss White and Rx 474 SWP Chelsea Gray. All panels are cedar bevel siding primed with Rx 450 Undercoater. The Florida exposures, vertical south, are being retired as of 3 years, and the Chicago panels, north and south, likewise at slightly less than 40 months. The basic formula (guide) of Rx 471 is Card 65, carrying 175 pounds of 6680 dry RCHT and 100 pounds of 6600 dry FF; that of Rx 474 is the regular as of the same time, made with 157 pounds of 6630 dry R-810.

In Rx 471, LW was used in four ways: at 100%, at 50/50% with FF, replacing all FF and replacing half of the FF. There was also a sample made with 100% FF. The Florida results showed possibly a little more erosion due to LW, but actually all the samples containing LW compared very favorably with the guide. The 100% FF sample also performed like the regular. The Chicago exposures look poor because of excessive show-through of the gray primer. LW and 100% 6600 show up somewhat cleaner than the guide, but are rated a little inferior because of greater erosion. The smaller percentages of LW seem quite satisfactory.

In Rx 474, the only changes were 50% and 100% substitution of R-300 for R-610. In this case, the Florida panels showed such obviously bad white chalk-mask on both R-300 samples that the Rx 474 group was retired at 12 months. The Chicago tests also show considerably worse fading with 100% R-300, but the partial substitution is fairly satisfactory.

A routine report was written covering the retiring of exposures 17396-17400 F, C at 24 months Florida vertical south and 36 months at Chicago north and south, regular cedar bevel siding panels primed with Rx 450 Undercoater. Three bodied oils from the Resin Research Department

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were tested in Rx 471 SWP Gloss White. The oils were based on Plaskon's Silicone Oil C, which was submitted as a silicone-treated oil which could be fortified with resins and bodied at a reasonable price. However, there was a serious error in the price estimates and consideration has been abandoned for this reason. The tests, incorporating mainly Dehydrol, glycerol and P.E., were in some cases reasonably close to regular Rx 471 in performance but on the average showed noticeably greater erosion and/or dirt collection and some microscopic checking.

Exposures 17674-81 C, F were examined and retired during the month. This series was a follow-up of an earlier group which had indicated that a chlorine treatment of zinc oxide results in improved mildew resistance. In this series St. Joseph Lead Company's #17 FR, a 0.3% Cl treated zinc oxide and also their #17 fluoride treated zinc oxide were evaluated. #17 is said to have better general durability than the #42 used in previous tests. Other pigments tested are:

Durham's Canadian Oxide, D.P.O., #67 G 10, with 1.3% Cl.
2059 - 6722 dry New Jersey's XX-503
2295 - 6721 " Azo ZZZ-33
108 - 6705 " New Jersey's XX-592

Cedar siding was used for panels exposed at Chicago vertical south and at Florida. 8 x 24" white pine was used for the Havana tests. All are primed with Rx 450 Undercoater, zincless, and the siding tests have a guide of Rx 471 SWP Gloss White using co-fumed leaded zinc. All tests substitute 6810 dry basic sulfate white lead and the appropriate zinc oxide for the co-fumed pigment. Exposure times are Chicago 26 months, Florida 24 and Havana 18, the latter two now being retired.

There were some minor indications at about one year, but they were not conclusive. No tests were any better in mildew resistance than their guides. The Havana panels at 18 months are all very heavy with mildew, but what little choice there is seems to be in favor of the tests. On the other hand, the Florida panels show appreciable mildew, quite uniform on the guides, and all tests show more than the guides. It is impossible to pick out any test as superior to any other in this respect. However, XX-503, 17 FR and Durham show definitely least microscopic checking, while XX-592 shows the most and ZZZ-33 and #17 are intermediate. The Chicago panels, having no mildew growth, show no appreciable differences.

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Exposures 21289-96 F, C were examined during the month. The purpose was to evaluate the stability of Sun Yellow pigment, 80 A 14 dry, a calcined nickel-treated TiO_2 from Harshaw Chemical Company, their number EL 458. The material was tried both in Rx 473 SWP Tinting White and in the low PVC Intermix White. The panels are regular cedar bevel siding primed with Rx 450 Undercoater shaded gray. They have been exposed 6 months at Florida vortical south and slightly longer at Chicago, south only. All tests continue on exposure. Results may be outlined as follows:

<u>Paint Tested</u>	<u>Results</u>
RB 4541 - Intermix shaded with Hansa	Glossy, good color; excellent except for bad mildew at Florida.
- - Same shaded with Chrome	Very bad fading; dirty at Chicago, bad mildew at Florida.
RB 4551 - Intermix made with Sun Yellow	Good. Much like Hansa, but a little more fading at Florida.
RB 4553 - Rx 473 shaded with Hansa	Not as glossy, not as good color as Intermix, but a little cleaner, less mildew.
- - Same shaded with Chrome	Fading serious, but not as obvious as in Intermix.
RB 4552 - Rx 473 made with Sun Yellow	Good. Fully equal to Hansa, in fact noticeably better color at Florida.

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#97 - SWP

SWP Verdas Green Rx 417 was reformulated to improve durability and tint retention. The proposed formulation 962 S is approximately 14% higher in cost than the present formula for Rx 417 Card 17. The new pigmentation is based on 80 A 14 dry L-458 Ti-Tint Yellow and 7910 dry phthalogreen. The proposed formulation has excellent brushing, flow, gloss, drying, etc. Samples and a copy of the formulation were sent to Cleveland for their approval.

Exposures 15210-27 F, C were retired during the month. The series contains miscellaneous systems, the purposes being:

1. To compare Pittsburgh's Titanic White #1-54 against Rx 471 SWP Gloss White and Rx 436 SWP Fume Resisting White, as of late 1950.
2. To test Rx 471, Rx 436 and #1-54 in four ways:
 - a. Over Rx 450 SWP Undercoater.
 - b. 2 coats self-primed.
 - c. One coat only, new wood at 450 sq. ft. per gallon.
 - d. Over Pittsburgh's #1-201 primer, low in lead. Further, there are tests of Rx 450 and of #1-201 as one coat only.
3. To test Rock-Cote #794-BT (breather-type) House Paint White from Rockford Paint Mfg. Co., Rockford, Ill. Tested as a, b, and c.
4. Because of anomalous results on the panel which was supposed to be one coat of Rx 436, series 16822-4 C, F was prepared as a double-check, testing one coat each of Rx 450, 471 and 436.

All panels are cedar bevel siding. The Chicago panels, north and south have been exposed 4 years; the Florida panels, south vertical 3 years. The supplementary series 16822-4 has been exposed 3 years at Chicago and 2 years at Florida.

1. Rx 471 versus Rx 436 versus Pittsburgh in general, considering mainly their use over the primers with which they are intended to be used. Both Rx 436 and Rx 471 are holding up very well at four years Chicago, the slightly greater dirt collection of Rx 471 being offset by slightly more erosion on Rx 436. Checking and cracking are microscopic only, relatively slight. At Florida the Rx 436 rates a little poorer because it carries more mildew in spite of its greater erosion, but again neither shows serious film breakdown. Pittsburgh's White over their primer shows little checking or cracking at Florida, but looks rather poor because of dirt and mildew; at Chicago it shows the same dirt collection, a bit more general film failure than Rx 471 or 436. A general look at all the 2-coat work involving these three paints confirms the indications stated above.

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2. There seems to be very little to choose between the tests primed with Rx 450 and those primed with Pittsburgh's #1-201. Even the 2-coat self-primed work in this series compares very favorably with the special-primed.

The most interesting tests are those of one-coat work. Rx 471 is eroded completely at Chicago, while #1-54 has held a little more film but looks nearly as bad because of dirt. At Florida the durability records of the two are more nearly alike. Rx 436 cannot be judged except as against Rx 471 in the supplementary series. At Chicago it shows no more failure than 471 and is cleaner; at Florida it shows definitely less failure than 471.

3. Rock-Cote #794-BT looks very poor at Chicago, especially as one coat and 2 coats self-primed. There is considerable failure (partly microscopic), serious erosion and bad mildew growth. This is verified by the Florida panels. The amount of mildew is rather surprising in view of the history of heavy chalk rub-off.
4. The supplementary group testing one coat only of Rx 450, 471 and 436 is partially covered under 2 (above). Rx 450, though heavy in chalk rub-off, shows little erosion and much less general failure than Rx 471 or Rx 436, but on the other hand it is dirtiest of the three. #1-201 (original group) shows about the same ultimate failure and general appearance on 1-coat work as Rx 450, although it chalked more freely.
5. Pittsburgh's Titanic White #1-54 has shown a very definite tendency to show rutile yellowing on the Florida exposures.

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Exposures 21842-8 CS, CN, F were prepared during the month for exposure at Chicago north and south vertical and at Florida south, all cedar bevel siding primed with Rx 450 Undercoater. The tests are all based on Rx 471, Card 77 SWP Gloss White. The purpose is to test three new grades of ground mica submitted by the R. T. Vanderbilt Company at a cost considerably lower than the micas presently being used in various S-W lines. The materials included in the test, all at 65 pounds per 100 gallons, are:

Vanderbilt's mica No. 2 1 - 2% residue on 325 screen

" " No. 5 5 - 6% " " " "

" " No. 12 11 - 13% " " " "

62 C 2 dry - 4 I mica, Mineralite Sales Corp.

6252 " - AA mica

6253 " - Alsibronz Special #12 mica

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