JUST PAINT

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THE SUBTLETIES OF COLOR

Small Differences That Make All the Difference

By Sarah Sands

Every painter knows the dance, taking a few steps back from the painting, their head tilted slightly askew, the eyes pulled tight into a squint, or the hand held in front to block off an area from view. The to and fro of action and adjustment, of sense and sensibility. And if color happens to be foremost in that dance, the search is often for still unseen subtleties to be coaxed from the colors at hand. Even if the effect is one of clash, there remains the desire for it to be 'just so'; a clash tuned to the highest pitch or given a particular piquant flavor. In the end, artists thrive on subtleties, on the small differences that make all the difference, and their search for colors that can respond to those needs is endless.

All these immeasurable things, no matter how rarefied they might seem, ultimately have a material basis rooted in the nature of pigments and paint, the common tools of the trade. In the pages ahead we will start by reviewing some of these underlying factors and then examine why some of the subtlest of variations can make all the difference in choosing the right color matching your intent.

Beyond All Measure: the Limitation of Colorimetry

When trying to describe what makes any particular color unique it is tempting to point to a color's location within a well defined system such as CIE L*a*b* or Munsell. Doing so allows us to feel that we can place the color's uniqueness within a mapped and measured space, and even calculate the degree of difference it has from all those other colors that jostle for a treasured spot of their own. But we would quickly learn that it is precisely those subtleties that are lost in the process. For all the accuracy of our spectrophotometer in reading the exact makeup of the light being reflected back from a sample, nothing in that information really tells the artist what they need to know about actually using that paint: how it mixes with other colors, its degree of opacity, tinting strength, or any number of physical attributes. Paint is ultimately color on the move, dynamic and energetic, and no single snapshot can capture that more vibrant life lived on the palette of the studio.

While clearly no system of measurement is perfect, spectral reflectance curves perhaps come closest to capturing the nuance of a color, especially if the spectrum is available for both masstone and a tint of a known percentage. With these two points as reference one can roughly gauge how a particular paint might perform in mixtures. However, care must be taken as even here there are difficulties. Cadmium and Hansa Yellow Medium, for example, might share nearly identical spectra at full strength but no one would mistake them for the same in practice. Additionally, one must factor in the responsiveness of the eye to various wavelengths, as this can greatly shape how the eye perceives the color – which can be very different from the data itself.

Underlying Causes of Subtle Differences

Nearly all of the subtleties of a particular color can be traced back to the physical attributes of the pigments and the way light interacts with those particles within a paint film through absorption, reflectance, scattering, and transmission. Pigments, in turn, are largely characterized by their underlying chemical composition, along with such factors as particle size, refractive index, and scattering coefficient, while paint films impact color through their pigment load, thickness, and sheen. Ahead we will touch on all of these briefly, as a way to introduce some of the complexity behind many of the subtle differences we see.

PHYSICAL PROPERTIES OF PIGMENTS

Crystalline Structure of Pigments

All pigments, with rare exception, have crystalline structures that dictate their color, and even small changes at this level can alter which wavelengths are absorbed or reflected. Phthalocyanine Blue, for example, has two types of crystal formations (α and β) that are responsible for their slight leanings toward the Red or Green Shade, while changes to the crystal lattice of Quinacridone is responsible for its broad range that runs the gamut of bright Quinacridone Reds to the ever deeper Magentas and Violet. A third example includes the entire array of Cadmium colors, where cadmium sulfide, which is yellow in its pure state, is made progressively redder and deeper by replacing the sulfur in the crystal lattice with increasing amounts of selenium. This substitution broadens the amount of the spectrum that can be absorbed, and if enough selenium is added, Cadmium can actually appear black.

Transparency/Opacity and Tint Strength

A particle's opacity is greatly dependent on its ability to scatter light, which relies primarily on a particle's refractive index and size. The larger the difference in the refractive index between a particle and its surrounding medium, the more light is scattered and the underlying layer obscured; a phenomenon similar to the way fog scatters a car's headlights. Conversely, the closer these numbers are, the more

transparent a particle will appear. The high refractive index of Cadmium Yellow and Titanium White, for instance, is almost solely responsible for their tremendous hiding power and sense of opacity, while Zinc White and Hansa Yellow appear more transparent because their refractive indexes are considerably closer to that of an acrylic polymer. Because dark pigments with low refractive indexes, such as the Phthalocyanines, do not scatter much light, their hiding power resides almost completely in their ability to absorb light, the pigment loading, and the thickness of the film.

The other aspect of particle size has equally dramatic consequences on both scattering and tinting strength. As a particle becomes smaller it scatters light more effectively until a certain optimal size is reached, after which this aspect begins to drop off sharply. As one continues further below this threshold, the pigment particle grows increasingly transparent while simultaneously reaching a maximum of tinting strength. Here is where the magic of the Transparent Iron Oxides reside, as the normally opaque iron oxide pigments are manufactured to such small particle sizes that they become wonderfully translucent and far more effective in glazing and the production of cleaner, higher chroma tints. Titanium White, on the other hand, is carefully manufactured to optimize its particle size for maximum light scattering, and hence opacity. In fact, a one centimeter wide crystal of Titanium Dioxide is completely transparent, and it is only as the crystals get smaller that scattering becomes dominant and we sense the pigment as inherently 'white'; an effect similar to the whiteness of finely ground glass. Should the Titanium Dioxide be ground even further down to a nano-particle scale, it would actually become completely transparent, a feat that seems almost magical given how strongly we associate opacity with Titanium White.

Purity and Uniformity

Differences in the chemical purity of a particular pigment, as well as the uniformity of its shape and size distributions, are responsible for still other quirks of coloration. For example, natural earths owe their particular flavors and nuances to varying amounts of trace elements, such as manganese oxide, silica, alumina and clays, as well as their wide assortment of particle sizes. While this accounts for many of their prized undertones, and explains why particular regions in the world become coveted for their mined ochres, siennas, and umbers, it is also the reason why these colors are generally weak tinters and lower in chroma than the parallel range of synthetic oxides. Also, because they are mined, these pigments have a wide lot to lot color variation depending on the level of impurities in the next shovel full. Ultramarine Blue presents another example; one of the earliest synthetic pigments, it is richer and more saturated than the genuine Lapis Lazuli it replaced, which as a mined rock always came with impurities of calcite, sodalite, and pyrite, that muted its tone.

THE PHYSICAL PROPERTIES OF PAINT

Film Thickness

As most artists know, colors do not necessarily stay the same through thick and thin. In thick films of densely packed pigment, the masstone is dominant and the color will appear more saturated and deeper. As the film becomes thinner, the undertone becomes more pronounced and the overall color can appear more transparent, lighter in value, and sometimes higher in chroma as well, assuming the underlying substrate is very light in tone. These effects are ultimately caused by having an increased amount of light reflected from both the pigments and the underlying substrate in the form of backscattering.

Pigment Load

Beyond film thickness, simply altering the pigment load or density in a paint film can markedly change the perception of a color. For example, in a film of densely packed translucent pigments, much of the interior scattering and transmittance of light can be lost through subsequent and repeated absorption, and one primarily sees just the reflected light coming from the surface. This reduction in light reads as a deepening in hue and a reinforcement of the dominant absorption band. As pigment load is decreased, and light begins to penetrate through the film, the interplay of scattering and absorption has a larger impact on the overall color. One can imagine a similar effect if placing identical sheets of stained glass on top of each other, one after another. As the pile grows thicker, the color will get increasingly deeper and more saturated.

At its most extreme, the spectral reflectance curve can change considerably as more and more light is able to penetrate deeply into the material. This phenomenon can be seen in such transparent colors as Green Gold and Nickel Azo Yellow, where a dramatic difference emerges between the mass and undertone, as well as a subtler shift in spectra for Phthalocyanine Blue G/S.

Sheen and Surface

Whether a surface is glossy or matte, smooth or textured, will ultimately impact a color's expression as well. As a paint film becomes glossier and smoother, there is less scattering of light at the surface and more penetration and absorption of the light by the pigments themselves. This causes darker colors to typically appear deeper and more saturated when they have a gloss sheen, and conversely, appear to lighten if matte; not unlike the phenomenon of removing a darker colored stone from the bottom of a riverbed and watching the seemingly rich color dissolve before ones eyes with the evaporation of the water.

CASE STUDIES

The spectral data used in the following case studies was obtained using a Minolta® Spectrophotomer. Samples were cast as 10 mil drawdowns on lacquered cards, with each color represented both at full strength and mixed with varying percentages of GOLDEN Regular Gel (Gloss) or Titanium White. Many of the graphs used in this article are spectral curves, which might be unfamiliar to many artists as they are not that common outside of laboratory settings. The easiest way to understand them is simply as showing the amount of light that is reflected from the surface for each wavelength in the visible spectrum. The more that is reflected, the higher the curve will be at that point. To make the readability a little easier, along the top of each graph we include markings showing the approximate range for each band of color, running from Violet through Blue, Green, Yellow, Orange, and Red. The x-axis, running along the bottom, is marked with the actual wavelengths themselves.

WHEN COLORS COINCIDE

Phthalo Blue (GS) Mixed 1:3 with Hansa Yellow Medium and Cadmium Yellow Medium

The Hansa Yellows sit across from the Cadmiums like a row of twins arriving late and uninvited to a family dinner. Contrary to many notions these are not the poor substitutes for the 'real' thing, but truly flushed with their own sense of flash and purpose within the painter's toolbox. The Hansas might not have the opacity of the Cadmiums, but their transparency allows them to be an essential ingredient for transparent glazes, deep greens, and composite blacks. For all the brash and brawn of the Cadmiums, the Hansas speak in their own bright voice.

Link to additional supporting visuals (click)

A good way to experience these subtleties is to watch how the two colors impact various mixtures. With a Phthalocyanine Blue or Quinacridone Magenta, for example, Cadmium Yellow Medium creates dense lighter-valued tints with a sense that white has somehow strayed into the mix. In the accompanying graph (Graph 1), notice how it produces a sharp spike in value after 500nm, and an elevated reflectance throughout the oranges and reds. With Hansa Yellow Medium, on the other hand, the saturation of Phthalo Blue (GS) is largely preserved and the hue is simply shifted towards green with a minimum increase in value. What is not as well shown here is the fact that the translucency is held onto as well, the mixture remaining ideal for glazing and developing other rich, dark greens.

SEEING THROUGH OPAQUE PIGMENTS

This section begins with pairs of synthetic and natural iron oxides whose differences revolve almost entirely around particle size, with the synthetic oxides being exceptionally small when compared to the usually chunky, larger-scaled pigments of natural earth colors. As mentioned earlier, when particles grow smaller not only does the total surface area increase rapidly, but their ability to scatter light diminishes as well. With scattering held to a minimum, the pigments' interaction with light is solely through absorption and reflection, which both maximizes their tinting strength and increases their translucency. As a result, the synthetic oxides will often be the preferred choice when needing brighter mixtures and cleaner glazes, while the more standard earths can provide a wonderful opacity and density when relying on their masstone.

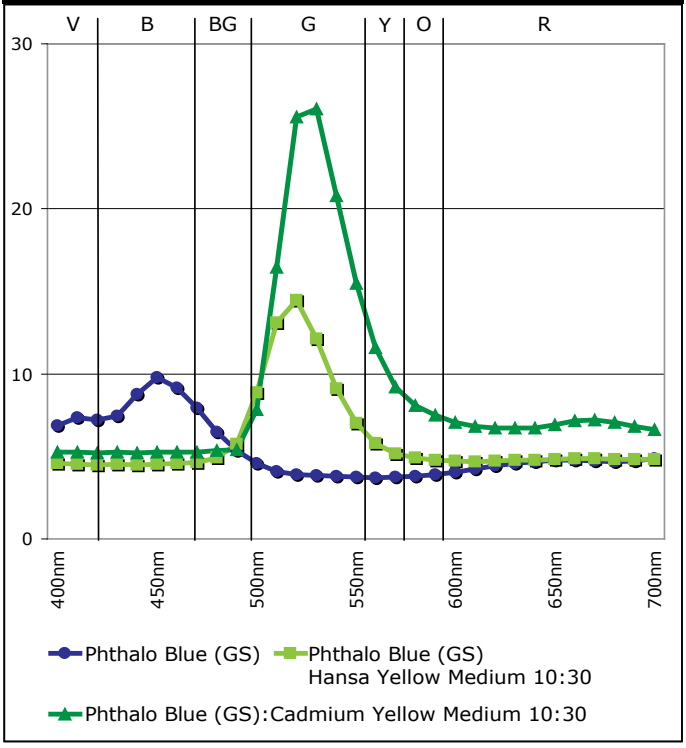
Yellow Oxide (PY42) / Transparent Yellow Iron Oxide (PY42)

Link to additional supporting visuals (click)

Yellow Oxide and Transparent Yellow Iron Oxide have differences that are a little obscured, perhaps, by their identical Color Index designation as PY42. In fact, many artists assume far too often, that pigments with matching Color Index names are unvaryingly the same. But nothing could be further from the truth, especially if reaching for a yellow earth for glazing or to use in tints or mixtures. And some differences can be seen fresh out of the tube, where the Yellow Oxide starts out brighter and very opaque, while the Transparent Yellow Iron Oxide has a much deeper, almost Raw Sienna masstone and is one of our most transparent colors. From there the differences grow, all tied to the singular issue of particle size more than anything in their chemistry.

The accompanying graph (Graph 2) traces changes in

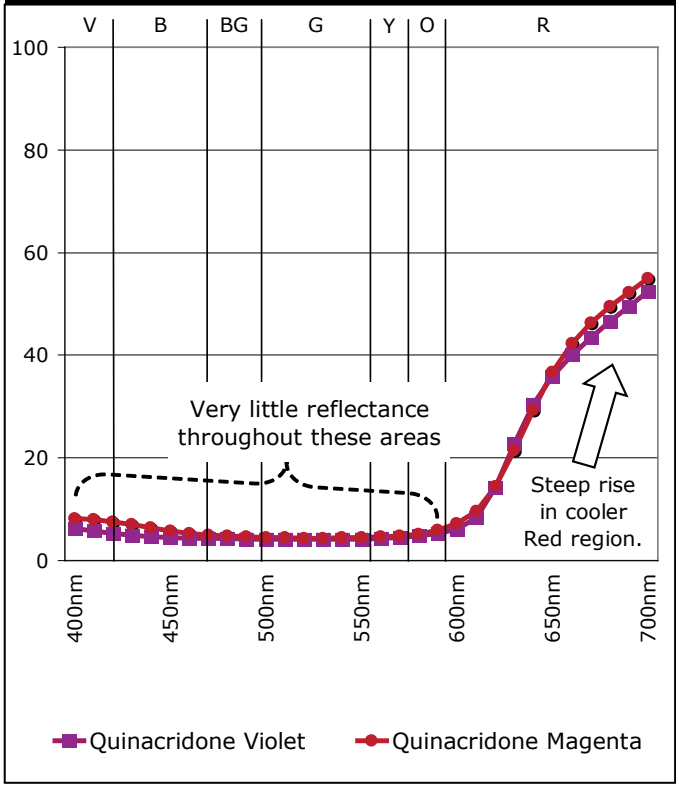
GRAPH 1: Phthalo Blue (GS) Mixed 1:3 with Hansa Yellow Medium and Cadmium Yellow Medium



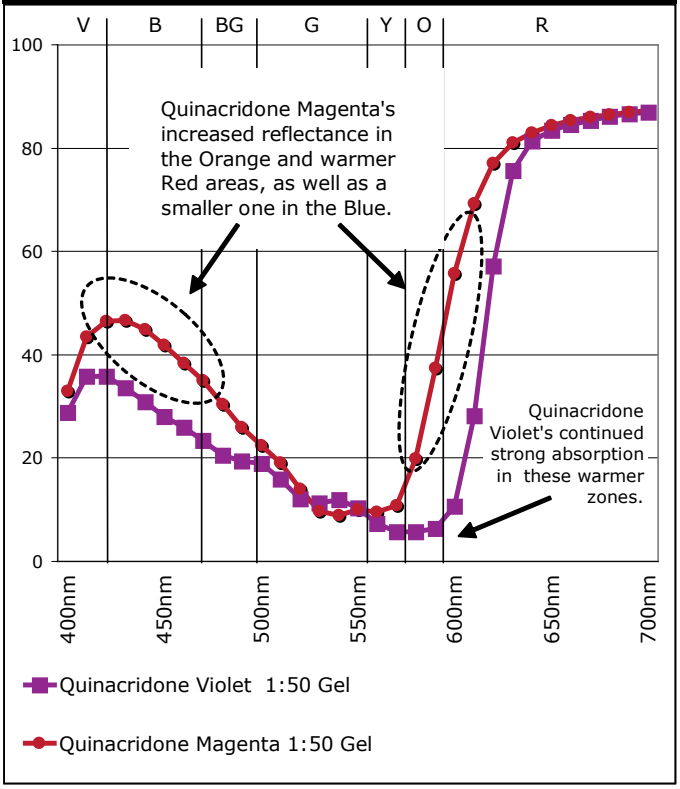
GRAPH 2: Yellow Oxide and Transparent Yellow Iron Oxide Mixed with Regular Gel (Gloss)

Chroma when varying amounts of gel are added. As one can see, Yellow Oxide remains relatively flat throughout, increasing only slightly as more and more gel is added. No matter how transparent you make it, Yellow Oxide remains a muted color with moderate saturation. On the other hand, while Transparent Yellow Iron Oxide starts appreciably lower in overall Chroma, it actually increases dramatically in saturation as gel is added, eventually surpassing Yellow Oxide at the 1:1 mark and continuing to rise even further. Paradoxically, perhaps, the color grows in brilliance as it is extended with gel, providing proof – should one ever be needed – that it is the better choice for creating luminous glazes.

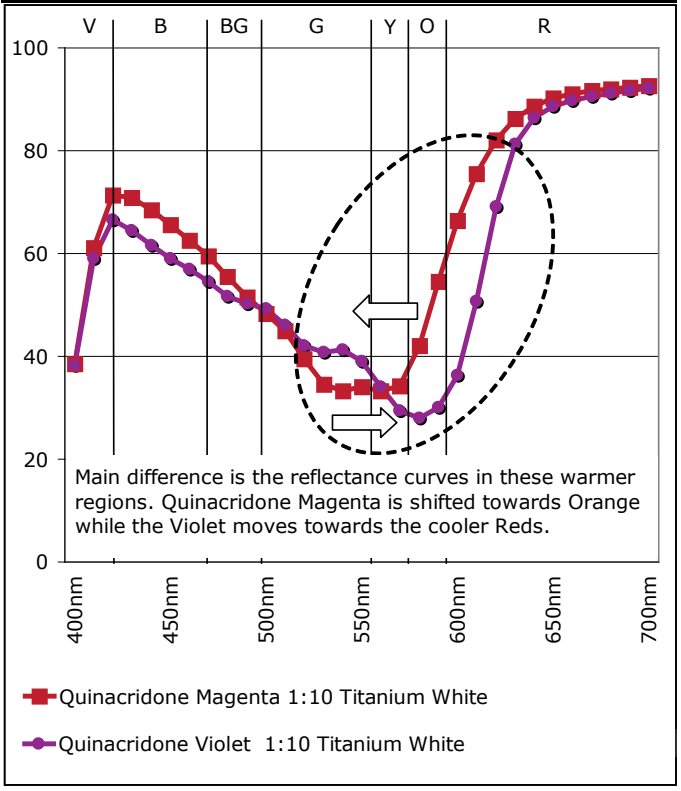
GRAPH 4: Quinacridone Violet and Quinacridone Magenta Masstones



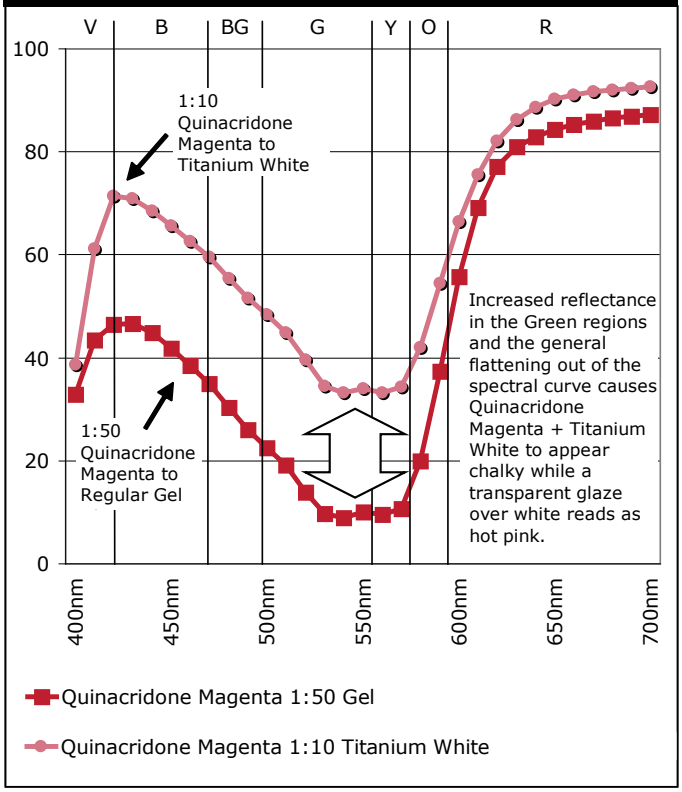
GRAPH 5: Quinacridone Violet and Quinacridone Magenta Mixed 1:50 with Regular Gel (Gloss)



GRAPH 6: Quinacridone Magenta and Quinacridone Violet Mixed 1:10 with Titanium White



GRAPH 7: Quinacridone Magenta Mixed 1:50 with Regular Gel (Gloss) and 1:10 with Titanium White



Burnt Sienna (PBr7) / Transparent Red Iron Oxide (PR 101)

In this grouping, well-known Burnt Sienna is contrasted with the similarly hued Transparent Red Iron Oxide. Both start off as mid-toned earths, the Burnt Sienna a touch brighter and with a slightly higher reflectance in the warmer orange to yellow range, while the Transparent Red Iron Oxide reads as a ruddy and rich mahogany brown, with its peak reflectance deep within the cooler range of reds. None of that, however, quite prepares one for the transformations that happen when the samples are tinted with white or mixed with gel to form a glaze. As the graph shows (Graph 3), for example, Transparent Red Iron Oxide jumps dramatically in Chroma, or Saturation, even when mixed as high as 1:1 with Titanium White. By contrast, Burnt Sienna remains very low in Chroma, never raising much beyond its starting point, as it forms the tell-tale cold and pasty pastels of nearly every brown when mixed with white alone. Similarly, when making glazes, the Transparent Red Iron Oxide blooms into rich browns with bright, fiery undertones of orange while the Burnt Sienna will always carry a slight sense of murkiness.

Link to additional supporting visuals (click)

FAMILY RESEMBLANCES

Quinacridone Violet and Quinacridone Magenta Masstones

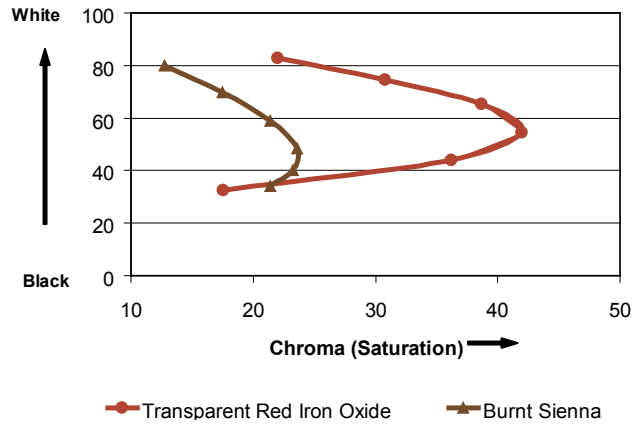
Quinacridone Magenta and Violet are one of those common cases of colors that seem so close together surely it couldn't matter all that much which an artist reaches for. Of course the answer depends somewhat on your needs. Quinacridone Violet is more opaque and bluer in the undertone than its more transparent, redder cousin. While these features go easily unnoticed when used full strength, the subtleties become much more pronounced when tinted or used in transparent glazes, as can be seen in the spectral graphs on page 4 (opposite).

Link to additional supporting visuals (click)

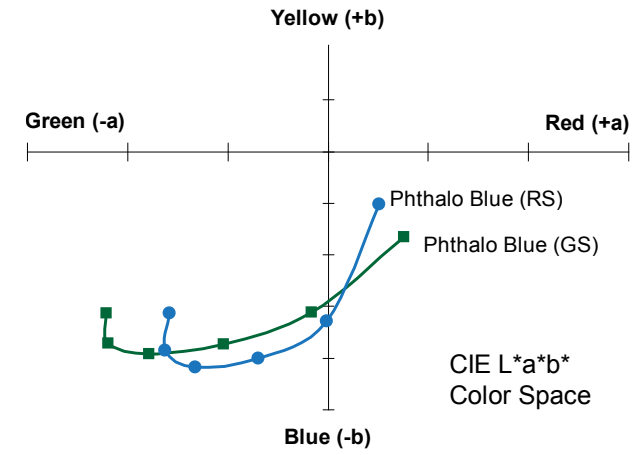
Notice how the spectral curves of the masstones of Quinacridone Violet and Magenta (Graph 4) have virtually identical shapes, with almost negligible levels of reflectance from Violet all the way through Yellow (400-600nm) until finally rising sharply within the cooler, outlying regions of Red. If one looked at these two colors, it would be difficult to tell them apart (see Web site). However, mixing these colors 1:10 with Titanium White or 1:50 with Regular Gel not only dramatically changes the shapes of their respective spectra but clearly highlights their differences as well. In both the transparent let downs (Graph 5) and the tints (Graph 6) of these colors one can 'see' the warmer aspect inherent in the Quinacridone Magenta, where its spectra now rises much earlier, indicating a new more orange component, while the Quinacridone Violet continues to exhibit strong absorption even past 600nm.

Another aspect to notice is the difference between the mixtures of Quinacridone Magenta with gel versus Titanium White (Graph 7). While the one with gel reaches a level of reflectance for cooler reds that is nearly equal to the same mixtures with white, there is a continued, extremely shallow level of absorbance in the 525-575nm range, which would be descriptive of a complementary shade of Green. Because this complement is suppressed, this transparent mixture is able to possess a very high and brilliant chroma, creating a scintillating pink that is impossible to achieve when adding white. It's a good lesson to remember for those constantly

GRAPH 3: Transparent Red Iron Oxide and Burnt Sienna Mixed 10:1, 3:1, 1:1, 1:3, 1:10 with Titanium White



GRAPH 8: Phthalo Blue (GS) and Phthalo Blue (RS) Mixed 10:1, 3:1, 1:1, 1:3, and 1:10 with Titanium White



frustrated with an inability to hit that jarringly high note. And the reason is easy to see. With the addition of white the spectral profile starts to flatten out, with more and more light in the Green range being reflected, which ultimately results in a loss of chroma and a 'chalkiness' as the cooler tones begin to essentially cancel or grey-out their warmer compliments.

Phthalo Blue (GS) (PB 15:3) / Phthalo Blue (RS) (PB 15:1)

These twins present an interesting conundrum where they start off ever-so-slightly reversed in terms of which masstone has a more measured red or green cast, with Phthalo Blue (GS) initially having a small edge in the red zone and an even a greater lean towards the warmer, violet end of the Blue range. As the colors are let down or tinted those positions reverse themselves and the warmer undertone of Phthalo Blue (RS) finally comes to the fore. One can see this in the above graph (Graph 8), where the Phthalo Blue (GS) starts, oddly enough, with actually more red then its supposedly warmer sibling Phthalo Blue (RS). However, once mixed with white, the Green Shade finally assumes its rightful place, passing across the trajectory traced by the Phthalo Blue (RS) and comfortably out-distancing it along the green axis. This peculiar flip-flop holds true even when extending these with gel and can be clearly felt when mixing with yellow to create various greens.

(continued on page 9)

Link to additional supporting visuals (click)

NEW TESTING RESULTS OF OPEN ACRYLICS

By Mike Townsend

Prior to being launched, the new line of GOLDEN OPEN Acrylics underwent a battery of testing to assure it met our standards as a professional artist product. These tests gave us a vast amount of data about the properties of this unique paint and valuable knowledge regarding its working properties. This information helped us finalize the paint formulation and also provided a resource for our product literature to assist artists interested in introducing OPEN Acrylics to their paint box. As artists expanded the uses of the OPEN Acrylics, new questions were brought up which gave rise to continued testing and evaluation. In this article we'll share the most current real-time results, as well as discuss some observations based on our testing.

Facility in South Florida testing the OPEN Acrylics at a severe 45 degree angle to the sun. Photo courtesy of Q-Panel.

Permanence Testing

Product permanency testing is a key part of any new material being created. This testing helps assure the paint is able to hold up over time. While the pigments used to produce OPEN do not vary from those used in the other GOLDEN paint lines, there are ingredients unique to OPEN, and so each color was carefully tested using both natural and artificial accelerated lightfastness testing. Accelerated lightfastness testing is one of the key determiners of a product's durability and during the initial developmental stage all the colors were assessed according to ASTM standard test parameters for lightfastness as well as the integrity of the exposed paint films.

Accelerated aging test booth at Golden Artist Colors.

GOLDEN relies on two types of accelerated artificial light devices. A Q-Panel Weatherometer bombards test panels with ultra violet (UV) light by means of UV-A 351 fluorescent bulbs and a Xenon Arc machine using bulbs filled with ionized xenon gas. Together they give us two reference points to increase our confidence of the overall stability to the damaging effects caused by exposure to the wide range of visible and the even more destructive range of radiation below visible in both natural sources of sunlight as well as UV radiation given off by artificial lighting such as fluorescent lighting. The general idea is to simulate what one might expect the products to look like after about one hundred years, give or take 50 years, as this science is just not exact enough to give extreme levels of confidence. (See Just Paint #16 for more information about Accelerated Weather Testing.)

While accelerated permanence testing is fine for a base understanding of the anticipated permanence of a product, real-time exterior exposure is always a greater confidence building exercise of paint's durability. But who is going to wait for the results to come in? We have committed to lengthier exterior testing to gain some greater confidence in the results from the accelerated testing. One of the most extreme locations for this kind of testing is southern Florida. The mixture of moist salt-laden air and UV rich sunlight can wreak havoc on any coating.

While the tests we evaluated according to ASTM standards involved approximately three months of exposure in this environment, we are continuing with longer sets of exposure. At the time of this writing we have fully evaluated nine months' exposure on the OPEN test panels that were returned from sunny Florida. The task at hand is to identify any changes to the paint film. Visual assessment is especially important to judge film changes such as cracking, erosion and clouding or hazing. We look for surface degradation, adhesion failure and color change. Gloss readings are taken via instrumentation to track gloss changes. Differences in color change can be the result of pigment fading, pigment darkening, and also binder change. Typical measurements are compared to a control unexposed specimen to evaluate the total change in color (Delta E) and the full CIE L*a*b* color space data.

As these surfaces are exposed to an outdoor environment they tend to be coated with grime. The paint layers are first cleaned prior to taking sample readings on a color spectrophotometer.

After conducting and evaluating the QUV, Xenon Arc and southern Florida exposure testing, we have found that the OPEN Acrylics behave very similarly to the Heavy Body Acrylics. As we are using the same pigments in both systems, the overall characteristics regarding lightfastness are in line. The only consideration here is that the OPEN film takes much longer to form. Exposures of films in exterior applications before

complete film formation occurs (measured in months, and not days) can show severe film degradation, resulting from an incomplete film formation. However, if the same paint films are allowed to cure well, they behave quite similarly to our other acrylic paints.

Testing Data Summary

Overall our findings show the OPEN colors are holding up as expected and in parallel to our other paint lines. The three points of testing – QUV, Xenon Arc, and real-time exterior exposure – conclude the product line is a robust paint film.

These test panels were cast and allowed to fully dry for 30 days before being sent down to the test location. This is different than what can be done on site during an exterior mural painting process.

If an artist were to use OPEN for an exterior mural, it's far too likely the paint would be exposed to rain, humidity or dew, resulting in bands of color streaking down and ruining the image. Considering our current recommendation is to allow for 30 days of curing time prior to varnishing, it's easy to realize even the most pristine climates are not likely to have perfect weather for a couple of months running. All of these concerns lead us to one conclusion: OPEN Acrylics are not well-suited for direct exterior mural painting.

What would be acceptable is simply painting the mural on a suitable exterior quality substrate (such as M.D.O. plywood, aluminum panel or exterior rated mural cloth) in the studio. After it has been allowed to cure indoors and has been properly varnished with GOLDEN MSA Varnish, then the work may be displayed outside.

The Effect of Substrate on the Working Time of OPEN

When asked about the expected working time of OPEN we hesitate to give an actual number because of the large number of variables influencing such a statement. It is near impossible to accurately predict what the combination of temperature, humidity, air-flow, film thickness, and other factors contributing to working time will allow each artist to achieve. When we do make such a statement of expected working time, as in the OPEN Acrylics Product Information Sheet, it's done under a set of controls. Not very many artists apply paint using a 10 mil drawdown bar on lacquered cardstock.

The better question to ask when it comes to working time is, what are the controllable factors to achieve maximum working time? The list becomes shorter immediately. Within a painting studio it is possible to reduce the temperature and increase humidity. Of these two, humidity is the one factor much more likely to influence OPEN's working time. The higher the humidity, the slower the paint film's water and other additives' evaporation rate will be.

Film thickness is also a large contributor when discussing working time. It is important for us to remind everyone about the other impacts this has for the artwork. Thicker paint layers do dry slower, but may in fact be a lot longer than one first bargained for. In testing where we looked at films ¼" thick, the paints literally took several months to become tack free.

Airflow is a factor that is somewhat overlooked, and yet our lab studies have shown it to be one of the most influential contributors to the rate of OPEN Acrylics drying. Moving air assists water, retarders and other additives in escaping the drying paint layer. One should have a good rate of air exchange in the studio, but avoid fans or other air sources from blowing directly onto the painting, unless of course you want it to dry faster.

Finally, there's one last influential factor remaining that perhaps has the greatest impact on open time and that is the painting surface. More specifically, the painting surface's absorbency.

There is a large variety of substrates an artist can choose to use for painting. Controlling absorbency does not mean one has to abandon a favorite, but it does mean choices need to be made on how the painting is composed. If absorbency is ignored, then every other factor including the paint formulation is unable to achieve a long working time. One simply cannot expect maximum painting time when the highly absorbent surface is wicking away all of the slow drying additives.

Sealing the surface with faster drying paints or mediums is the most practical solution when working on absorbent surfaces. When and how the artist seals the surface is really up to their needs. When painting on watercolor paper, washes of color may be desired. This can be done with Heavy Body Acrylics or Fluid Acrylics. Once the washes are complete, then the paper can be sealed with acrylic medium to serve as a translucent sealer. Alternatively, a more opaque under layer might be desired. The same Heavy Body or Fluid Acrylics can be used to block in color and establish the base painting and because they dry readily, the OPEN Acrylics can then be used almost immediately for the detail work. Still another method for reducing absorbency is to use an acrylic medium as a sealer before any paint is applied. Whatever seems the best approach at the time is the one to go with.

This doesn't mean one absolutely has to seal the surface with a medium or paint before working with OPEN. It just means the first layers should not be expected to yield the full potential working time. Sure, the absorbent surface is still wicking the additives from the paint causing it to set up fast, but if the artist continues painting, the process eventually results in a sealed surface and subsequent paint layers then begin to have a greater working time.

Average Working Time of OPEN Acrylics
Test Results of 6 Mil (.006 inches) Thick Paint Films Onto Various Substrates

Substrate	Uncoated 300# Water-color Paper	GAC100 Sealed 300# Water-color Paper	Uncoated Cotton Canvas	Gesso Primed Canvas	Gesso Primed, GAC100 Sealed Canvas	Gesso Primed M.D.O. Panel	Gesso Primed GAC100 Sealed, M.D.O. Panel
Wet Time[i]	5-10 Min.	10-15 Min.	2-5 Min.	25-35 Min.	35-45 Min.	25-35 Min.	35-45 Min.
Workable Time[ii]	10-15 Min.	20-30 Min.	10-15 Min.	55-65 Min.	85-100 Min.	70-85 Min.	110-125 Min.

Wet[i]: The period when the paint retains the initial feel from the tube, before the loss of volatiles causes a noticeable change in viscosity and brush drag.
Workable[ii]: This phase overlaps the Wet period. The paint is becoming thicker, but not to the point of negatively impacting the painting process. It is within this range that many painters will find what they term their "sweet spot".

New Technical Support Colleague at Golden Artist Colors

AMY MCKINNON

I am a materials geek, a paint junkie, colored goo makes me tick. For years I thought it made a difference, what kind of goo you pushed around. I thought it defined you. As an artist you often search to define yourself. Your life becomes about self declarations. You must declare yourself: an artist, a painter, a sculptor, a printmaker, a ceramicist, a glass blower. You then declare yourself within a genre: a still life painter, a portraitist, a plein air painter, an abstract expressionist, a PoMo conceptualist. These declarations are important in order for us to present ourselves accurately. When we start to define ourselves specifically by the type of paint we push around we limit ourselves, we become myopically loyal to a binder. No one ever taught any artist to make these declarations. I think we do it because we need to define, distinguish and separate ourselves for the benefit of our audience and ultimately ourselves. The problem with these declarations is that they begin to limit our potential by forcing us to limit our intentions. I was guilty of this myself. While I will define myself as a painter, I have recently learned to stop there. My introduction and immersion into the world of acrylics has taught me a lot about the endless possibilities of polymers and the endless possibilities of people whose creative intentions inform the products that exist and the ones yet to come.

Before coming to Golden Artist Colors I had a long history of pushing around colored goo. I started painting when I was fourteen years old. I received my Bachelors of Fine Arts in painting from Moore College of Art and Design in Philadelphia. For the next eight years I painted, established myself in the art community of New Orleans and began to push my work beyond technical proficiency concentrating more on conceptual ideas. In 2003 I decided to apply to graduate schools. I chose to attend Tulane University and graduated with an MFA in 2005. I was hired for the fall semester of 2005 at Tulane to teach painting and drawing. Two days before classes began Hurricane Katrina made landfall and that particular career path was never the same. When I was able to return home four months later without a job or many of the conveniences of normal life I just painted. Over the next three years I painted, showed my work and continued to look for interesting jobs and opportunities that could take me out of New Orleans. While I loved the city that care forgot, jobs in the arts were few and far between and supporting oneself as an artist alone proved itself as inconsistent as the weather.

My paintings have always taken a more traditional approach in regards to genre. For many years I have painted still life. While this genre is often viewed as scholastic or dated I view it as the ultimate symbol of man. I believe our possessions define us. Our stuff is a symbol of our humanity. It represents what we need, what we desire and what we covet. It defines the "material us" which in turn defines how we spend our time, our money and our efforts. Our preoccupation with accumulation is our distraction of the inevitability of death. I have continued to paint still life since moving to New York. Working in acrylics has allowed me to be less conservative with my paint application. Oil paints like to be and were designed to be applied with a brush or a palette knife while acrylics beg to be pushed, prodded, poured and slathered around. Acrylics are plastic in composition and plastic in nature. They are flexible in form, allowing the artist's intentions to be just as flexible.

I started my Technical Support position at GOLDEN in December of 2008. My amazement that a position exists in which I talk to artists all day, help solve their dilemmas and am able to constantly research and learn has not abated with time. I did not take this job because I needed a job but because it is a position that I thought had only existed in my head, a dream job, if you will. I had also never been in a position in which my rare and specified skill sets were desired. I automatically felt a kinship and connection to my role and to the people here. There is an excitement that GOLDEN employees have about where our paint ends up. Not just whose hands end up using the paint but an excitement in the paintings and artwork our product comes to inhabit. The ownership of the company by each employee contributes to a sense of pride and personal accountability so rare and attractive in today's workforce.

As I near six months at GOLDEN, I feel more and more a part of this rare community. With this job has also come a wealth of knowledge and view of the art world from a completely different perspective. I value the time I have spent here and look forward to years of providing technical support to artists and helping the Golden Artist Colors' brand to proliferate by accommodating the artist's intentions.

TECHNICAL VIDEOS

Seeing is believing

By Ulysses Jackson

You'd think we had to get hit on the head with a rock to recognize that if we provided visual artists with visual tools, we'd probably make our efforts to share information much easier. Well now we think we've got something to more closely meet your needs and desires. Due to requests from consumers, GOLDEN has begun creating technical videos that cover many of the common product questions the company's Technical Services Department receives on a regular basis. The power of video allows complex topics to be explained quickly and clearly with minimal subjective interpretation. GOLDEN is committed to producing a substantial number of videos covering many diverse technical questions. Below is a list of the videos currently available, along with short descriptions of content.

Each video can be found on the www.goldenpaints.com Web site in the "Technical Info" section as well as on the GOLDEN Company page of www.youtube.com. Artists can download the videos or link to them using a simple cut-and-paste method from the YouTube™ video page.

Screen shot from video showing proper mixing procedures for MSA Varnish.

Screen shot from new video demonstrating the open time properties of the new OPEN Acrylics.

GOLDEN MSA Varnish - Correcting Incompatible Mixtures gives procedures regarding how to correct a batch of MSA Varnish accidentally thinned with an incompatible solvent.

GOLDEN MSA Varnish - Solvent Compatibility Test explains how to test for solvent compatibility when thinning MSA Varnishes.

GOLDEN MSA Varnish - Thinning details the materials necessary and the steps for thinning MSA Varnish.

Creating and Printing on Acrylic Skins with GOLDEN Acrylics and Digital Grounds offers step-by-step instruction on creating and printing on Acrylic Skins with GOLDEN Acrylics and Digital Grounds.

Printing on Specialty Papers with GOLDEN Digital Grounds shows the use of GOLDEN Digital Grounds to coat specialty papers with easy to follow, step-by-step instructions, including tips for making your projects simple and problem free.

GOLDEN Clear Tar Gel shows the properties, proper mixing and color addition, and uses of GOLDEN Clear Tar Gel.

GOLDEN Silverpoint / Drawing Ground demonstrates the ease of application, properties and uses of GOLDEN Silverpoint / Drawing Ground.

Working Time on Sealed vs. Unsealed Surfaces with OPEN Acrylics demonstrates the level of control in drying time that one can get when working on the appropriate surface for specific techniques.

OPEN Acrylics vs. Heavy Body Acrylics - Four Days on an Uncovered Palette is a unique demonstration of the vast difference between these two very popular products.

(continued from page 5)

THE SUBTLETIES OF COLOR

Small Differences That Make All the Difference

When I was given the task to write about the nuances of color I was excited. Extremely excited. And who wouldn't be. After all, color is at the core of what moves my heart and shakes my soul. A few days later, however, Mark Golden stood in my office, looking very grave and solemn. It seemed a small detail had been overlooked, a minor oversight which now loomed large. Apparently, when assigning this article, Mark forgot it would be appearing in the one and only issue every year done solely in black and white. My face went pale. "Black and white?!" I blurted, my voice rising until finally trailing off like a distant muffler backfiring: "But….but…." It was no use. The dream of showing fabulous drawdowns of rarely seen subtleties was suddenly shattered; and while the topic of color may be many things to many people, the one thing it clearly is not, is black and white. So I pleaded and implored, and was eventually reassured that, at the very least, we would still have the web. And so dear reader, that is where I beckon you now to turn your sights; to see a dazzling display of drawdowns showing the real (or at least virtual) subtleties of color that lurk behind these many graphs of gray: http://www.goldenpaints.com

In addition to a wide assortment of drawdowns for each of the examples in the article, the following additional case studies will be shared: Pyrrole Red (PR 254) / Cadmium Red Medium (PR 108), Carbon Black (PBk 7) / Mars Black (PBk 11), and Nickel Azo Yellow (PY 150) / Green Gold (PY 150, PG 36, PY 3). We also hope to be able to post the complete collection of more than 300 drawdowns of all the colors we examined, mixed with varying percentages of gel and white, providing one of the most thorough detailing of color available anywhere.

Jackie Battenfield -

The Artist's Guide:

How to make a living doing what you love.

Mark Golden: Jackie, this past June you published, *The Artist's Guide: How to Make a Living Doing What You Love.* What got you started on this journey?

Jackie Battenfield: In 1989, I took eight years of experience running the Rotunda Gallery, a non profit exhibition space in Brooklyn, and decided to use those skills on myself to make a living from my painting.

It was a similar time to now, the economy was in recession which had hit the New York art world pretty hard. I also didn't pin my hopes on one gallery, but decided to develop a broad base of support for my work with multiple art dealers throughout the USA. I did my research, interviewed friends, corresponded, received tons of rejection, but positive responses as well. Over the next few years I began relationships with art professionals who had an audience for my work.

In 1992, the Bronx Museum of the Arts asked me to take over the Artist in the Marketplace (AIM) seminars. This program was twelve evening sessions with a select group of emerging artists where they would meet with art professionals and discuss business issues.

It was a perfect fit for me, my night out, and helped relieve the isolation of my studio practice. I could take the lessons and challenges I was facing building my own career and share the information with a motivated group of emerging artists.

Mark: Did you set that curriculum up for the AIM program?

Jackie: Not entirely, the AIM program had been around for over a decade, but I made changes. I created more interaction between the artists, assigned homework, nurtured community, and shared my "from the trenches" experience.

I could speak frankly as one artist to another in a safe place where we could discuss issues and exchange information as colleagues.

Mark: I think that comes across really well in the new book too, the voice of someone who's been there.

Jackie: I encouraged the artists to bring in their experiences -- the good, bad and ugly. Often, an artist thinks they are the only one struggling with an issue that everyone else has figured out. Sharing helps you realize others grapple with it, too.

Mark: I've run across many AIM artists that went through the program with you and noticed how grateful they were for the program and their admiration of your skills.

Jackie: Thank you. As my AIM seminars became well-known, I was invited to do others. I helped design workshops for the Creative Capital Foundation, and I teach a professional development class in the MFA program at Columbia University. These experiences have allowed me to sharpen my skills teaching strategies of self-promotion, grant writing, financial management, and organization to artists at different stages of their career.

The weekend retreat developed at the Creative Capital Foundation has allowed me to work with wonderful artists around the USA. I have witnessed and addressed the challenges they face to maintain their practice in big and little cities, small towns, and small rural communities.

Mark: Jackie, can you talk a little bit about creating a college level curriculum, I assume it created some significant challenges and debate.

Jackie: The wonderful thing about a semester class is that I get to provide information systematically and assign homework. I concentrate on those skills artists need the first decade out of school. I have found some messages are hard for a student to comprehend, such as how isolating your studio practice can be and the self-discipline necessary to create art in the midst of juggling life and an outside job.

Working with students over fifteen weeks, I can address the organization, promotional, and financial challenges they will encounter and walk them through ways to manage them. These are the skills that are seldom addressed in a structured fashion outside the occasional career workshop. There is a significant difference between the systematic approach of a semester-long curriculum and the hit or miss of workshops.

Mark: I'm sure there have been some incredibly inviting schools, but many say what you teach is careerism when speaking of educating the student to survive as an artist.

Jackie: That's unfortunate, as my classes are designed to help artists understand and apply skills and techniques that will allow them to make their best work over a lifetime.

Mark: Careerism. Well, the battle is not amongst the students who are so appreciative of the information, or certainly emerging artists who are now in the real world and hadn't got that education, but it's the educational institutions that seem to create the greatest obstacle to these classes.

Jackie: My book and classes are about teaching life skills: how to maintain a studio practice. They're not about how to get famous, but how to live a fulfilling life as an artist.

Mark: I saw that several times in the book you downplayed your incredible credentials for what you do, Jackie. I wonder, at some point when you'll be able to consider yourself more than 'working in the field'.

Jackie: [Laughter] I do have a lot of experience working with artists and am able to provide one example of a satisfying career. Our society does not offer up many models of success outside the art stars or skid row. So artists end up judging themselves by polar opposites. But if you ask most artists what success means - it is having the time, space, and money to make the art they envision, and sharing it with a receptive audience.

Mark: Well I know you're aware of all sorts of books, videos, and websites that are offering marketing how to's for artists. What makes *The Artist's Guide* different?

Jackie: Yes, there's a lot of advice out there. Over the years I consulted many career guides for artists. Most aren't written by practicing artists so they can't speak to an artist in the intimate way I can, as I face the same challenges they do.

So my book goes beyond telling an artist WHAT to do, it addresses WHY they should do it. How it will benefit

them. For example, given limited time and resources, artists need to understand the payoff of a well written artist statement, keeping records, networking, or a budget, otherwise they won't make the investment to do it.

Mark: What was also helpful are the quotes from a wide range of professionals peppered throughout the book, a network of the larger artist community to share, and stress the points you were making in their own words.

Jackie: Absolutely. When teaching my AIM and Columbia students I found that when another art professional validates the information I've given them, the point is driven home, so I included other voices in my book.

Jackie: I conducted 34 interviews with art professionals, many of them artists accomplished in several fields. For example, one of the arts lawyers I interviewed, Sergio Sarmiento, became a lawyer as part of his art practice. Jaq Chartier is a widely exhibited painter and co-founded a Miami Basel art fair.

Mark: You've also continued to use the website you started even before the book was published. What was its purpose and how do you see it evolving?

Jackie: There's probably no better marketing tool than a good website. I wanted to share the interviews I was conducting right away, so eighteen months before the book was released, I began posting them on the book's website. That information has been used by artists and teachers and their students long before the book came out.

Mark: It's a great contribution and offers opportunities beyond the book as well, Jackie.

Jackie: It took a lot of effort to edit the transcripts and slowed my writing but was well worth it.

Mark: What I found really profound was that the book speaks to any businessperson who's a sole proprietor. Why is it such an uncommon message to share with artists?

Jackie: 'Cause artists don't consider themselves a business. These days an artist's education is in an academic environment that values teaching technique and theory. The student has no opportunity to witness the day-to-day issues artists encounter. Most programs insist there is no room in their curriculum to address practical matters. In the past an artist's education came through apprenticeship to a master. You started sweeping floors and moved up to painting the backgrounds. As you stepped up the ranks you watched the master artist run the studio and court patrons.

Mark: There's a real separation that seems so arbitrary.

Jackie: Yes. Art professors present one kind of model, teaching to support an art practice. Most of them can't address other ways to sustain a career outside the academy.

Mark: Jackie, when you were writing this book, it was smack in the middle of this severe economic crisis. Is there a message in *The Artist's Guide* that responds to what artists are facing now?

Jackie: What I address in the book are tools and techniques that serve artists during economic upturns and downturns. They are life skills that can maintain them in any economy. Even during the best of times an artist can have a show that doesn't sell.

Mark: Or even in the midst of good times artists are unlikely to be supported by the gallery.

Jackie: Right. My book discusses skills anyone can learn.

Mark: So our current circumstances don't really matter.

Jackie: I don't want to underestimate its challenges, but an artist could experience scarcity in the midst of plenty or have multiple opportunities in an economic recession.

Mark: Jackie, even before the book's release you've been one of the most sought out experts and lecturers on the development of artists' careers. Have you managed to insert art making back into your life?

Jackie: I'm in my studio allowing new work to slowly generate.

Mark: Thanks, Jackie. For most people, any one of the single career paths that you've taken would have been enough to pursue, but you've managed multiple paths and navigated them incredibly well. Thanks for sharing your story.

Jackie: I feel lucky to wake up every day and make art or work with my community. What better life could you ask for?

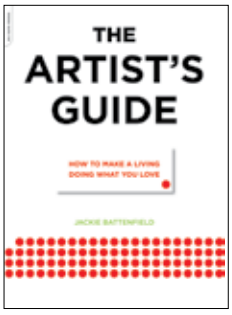
About the Author

Twenty years ago Jackie Battenfield was faced with the frightening choice many artists confront: give up on her own dreams, or discover how to make a living from her art. Applying her experience as a gallery director, and after years of trial and error, she achieved her goals, and then some. Today in workshops and seminars in New York City and across America, Battenfield shares these skills with artists at all stages of their career. *The Artist's Guide* picks up where art school leaves off, and teaches artists how to succesfully share their talent with the world.

With equal parts of practicality, warmth, good humor, and insight, Jackie Battenfield shares her years of experience as a self-supporting artist and makes the overwhelming task of growing and sustaining an art career clear and manageable. *The Artist's Guide* is a resource artists will return to at every stage of their career.

Jackie Battenfield is represented in galleries throughout the United States and in over a thousand collections worldwide. She teaches professional practices at Columbia University and for the Creative Capital Foundation.

Visit www.artistcareerguide.com today to order your copy of the book and access over 20 full-length interviews with gallerists, art lawyers, curators, and artists.



INSIDE THIS ISSUE:

We have an amazing person joining our six member Technical Support Services team, Amy McKinnon. If you have called or emailed GOLDEN, you know these folks provide an unequalled level of technical information. Amy describes in her own words, her journey to find her place here.

Ulysses Jackson and Mike Townsend have been the inspiration behind the new online videos that start to explain the unexplainable, like saving a varnish when you've added the wrong solvent.

Mike has also gathered the latest technical information on the new OPEN Acrylics. These products continue to get incredible reviews, allowing artists to achieve works thought impossible with more traditional acrylics.

Released in June is an incredible new book by longtime friend, Jackie Battenfield, called *The Artist's Guide*. Supporting this effort is a valuable way to provide a resource to artists struggling to manage their creative lives. We're proud the Golden Foundation became the first sponsor. Jackie, in an interview conducted with her this summer, shares some insights that generated this guide.

Finally as we share technical insights from your many questions we receive daily, there is no end to the questions and nuance of color. Sarah Sands, Technical Services Supervisor, describes some of the most indescribable subtleties around color (and she was also out the day we gave assignments).

Best, Mark

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