A Lexicon of Drawing Problems and Solutions

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A Lexicon of Drawing
Problems & Solutions

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Johannes H. von Gumppenberg
For Janet: No worker in whatever calling may hope for a more gracious gift than lucid understanding joined with love.
The best artists are makers of form so compelling that it is able to hold the viewer's mind and heart. In drawing no endeavor of observation or construction ought to be be-

A LEXICON of DRAWING PROBLEMS & SOLUTIONS

Johannes von Gumppenberg

Beyond the artist's grasp, while skilled hands are his bodily fitness for his task. Yet, technical learning & dexterity are not enough. In the sense that writers study rhetoric to learn to state their meaning with persuasion, so must artists master composition in order to show beautifully what they desire not only to see but, in addition, treasure.

These pages are no substitute for exhaustive texts on lettering, descriptive geometry & other disciplines from which I had to borrow. Nor is this a "howto" work trying to replace the teacher but is intended solely as a study & instruction aid.

G.v.G.
If we start at left or at the top, we may wish—as we retrace—to go the other way. At first, guide lines will help. But, in time, they ought to disappear. The G-S & 5-6 strings show especially that these drills demand less legibility than numerals or letters we need to give us information. It should be always our pleasure & desire to attempt new patterns, 1996.
Skill Exercises reveal weaknesses, mine are pushing level lines, obliques & the corresponding curves from Right to left. As drawn that way, preceding shapes are likely covered by the hand & cannot serve as samples for their followers. Light linear guides offer the first attempts almost indispensable. Proceed from right to left; then retrace—beginning at the finish & ending at the start.

Traversing all the page, draw lines in every combination and direction, particularly those you find uncomfortable to pursue. Then re-shape them—still in all directions & without any rotation of the page—till a coherent, powerful design result & yields a harvest of new shapes.

Enhanced Drawing

J.G.
1996
With practice the pencil as a sighting rod allows us to assess & transfer angles accurately.

MATERIAL OBJECT

ON THE DRAWING BOARD

ARTIST

Fill each Box with the Parts showing in the Frame.

Tracing on a Window Pane

The Divided Frame
Find more ways to judge location and direction.

TAKING MEASURE and ASSESSING ANGLES

J.G. 1992
A paper page 18" x 24" has a length to width relation of 3:4. A cardboard 6" x 8" with diagonals inscribed yields proportional openings of any desired size. Mark off the chosen distance on one diagonal, and repeat this measure all around. Then connect the four marked off points.

The forward face lies at an inclination to the picture plane. Ex. therefore, in a different perspective.

Parts of form in the same perspective as the Picture Plane are neither separately foreshortened, nor do they on their own converge, but do both, conjointly with the Picture Plane.

The View Finder reveals pictures in the most unlikely scenery and is besides a tool for perspective orientation.

F.G. 1998
These Grids deliver accurate reduction & enlargement. Chiefly used to magnify.

The divisions may be rectangular or square.

the grids are employed also for all manner of distortion of form as well as pattern.

Small Grid for Details.
To let the area run truly, curve in the shapes & in the way the corners are more in the view. The preparation for them can be shown.

This dotted line does the 3 partitions for the 3 facades.

The smaller rectangles yield as useful a diagram on the construction of the gables & as needed in the chart as the chart itself. The details of the gables are quicker and simpler to draw & may at times prefer them.

If the distinction between the sharp & the blunt corner is rightly considered this construction will serve you.
FLYING FORMS

We are used to level arrangements of objects whose vanishing points fall upon the visible horizon. Yet, if you place one of the solids on the right leaning or tumbling into space, it will throughout assume numerous perspectives—all of them correct & true; and these perspectives will then accord with vanishing traces whose tilting angles and positions of the vanishing point will be determined by the vanishing traces whose tilting angles always alter.

As these arrays turn around a central vanishing point, the forms appear to be rather more affront in space than in their rolling.

The forms will turn or tumble best when each is drawn in its own & separate perspective rather than as on this page which appears wholly about our common center.
The picture space is yours to show with power what you want us to perceive.

2. This more complex display shows that our recipe cannot entirely suffice. Nor would an artist be in error for a different treatment of my composition. Some accent is still on building form—in the tope edge of the side walk, for example, but mainly on selected, signal parts, such as the arches & the gables. These, however, gain in weight as they grow remoter, with a final, greatest emphasis upon the view of the square & arch-topped openings toward which this whole perspective aims.

THE WEIGHT OF LINE

1. Our earlier, independent cubic forms allowed a different weight of stroke for every job the line performed. Form-building & near edges were heavy. More distant ones & lines seen through transparency were lighter, while instrument construction lines were lightest of them all.

3. My focus on the distance is an aptitude of the camera teaching that spatial depth owes more to overlap & graduation than to progressively diminished visibility, and the whole depends most on the composer's eye. For mechanical plans are only overall. They cannot pay the attentions a strong & firm designer demands along the way.

J.G. 1993
I. Diagonal divisions into 4 spaces yield 5 horizontal levels & a vertical center line.

Central W-anishing Point & Eye-Level

Eye-level & C.V. are reset so that no level repeats another.

STAGES FOR A 5 TIER CYLINDER

II. Vanishing lines join the ends of the 5 horizontals to V.C.
The depth of the base square is estimated & drawn as line A-B.

Verticals from A & B cut all vanishing lines at the correct far corners of each level.

Lines parallel to A-B join the corners & set the distant horizontal limits of each level.

III. Diagonal divisions yield the perspective horizontal mid-lines at the top & bottom.

Verticals from A & B to their counterparts above or below the sides of every level at the corresponding points.
The horizontal lines between these points will be also the perspective midlines of the circles foreshortened to ellipses.

Erase no longer needed lines along the way.

IV. The apparent mid-line, cutting the ellipses into equal level halves, extends beyond the true perspective line.

Verticals through the end-points of these apparent long diameters are the visible limits of the cylindrical wall.

J.G. 1993
PEOPLE AS FURNITURE

All objects have to be in balance. That is, the center of their weight is vertically above & within the limits of the base.

The living figure achieves vertical stability mainly through a counter-balance of slightly oblique body-parts rather than by the right angles that mostly rule the man-made world.

J.G. 1992
You are not meant to draw these figures as they are shown. They are here solely diagrams for understanding the actions of the SUPPORTING LEG & THE LEG AT PLAY.

The load-bearing leg shifts towards the middle & so sustains most of the body's weight. The other is stationary & rotating upon the hip, may take several positions including—though rarely—that of oblique extension outward.

Both figures are distorted slightly to escape effects of perspective & for shortening upon the longitudes of the upper legs & thighs. Muscles may lengthen & contract; bone cannot.

Thus, with the pelvis sloped & so its lower side nearer to the ground, we may see how the unaltered measure of the great bones of the leg is accommodated to the lesser distance through bending at the knee.
THE BASIC MASSING

1. These depictions seem unusual solely by their geometric crispness. But, in fact, such basic massings of component volumes record what all of us can know or quickly learn about the human figure.

2. They are often the beginning layouts artists sketch loosely into place before anatomical or individualizing traits are induced upon the work & gradually take over.

J. G. 1992
Sketchbooks are Study-Books for recording observations as well as inventive inspiration & also for gaining ground on vexing difficulties.

My way upon this page of learning the unknown is personal and will suit those artists who own an aptitude for descriptive geometric tasks. Problems that we cannot master with sketchy spontaneity must be studied formally & pace by pace.

Upper Arm & Shoulder

2nd Study of the Thumb

For the work may not remain undone.

The Apeman's Dexter Hand

J.G. '96
The "All Purpose Nude" can be rendered plausibly in actions no person may be able to perform & surely no model will sustain.

Is He Ape or Is He Man?
Clear Construction & an Accute Designer's Eye will Allow your Play with the Impossible.

Twisting the Neck
The more a work is carried out as a design of visual parts we value for themselves—as here the line & shape—the more readily it tolerates alteration of the merely factual & commonplace.

On the page that treated “Basic Massing” I had little room for license with construction. Yet eloquent coherence must be designed more than it is geometrically plotted, and liberties for exceeding those used here may compose powerful inventions.
You may discover the early petroglyphs in their place and plant. Once traces cohere, antediluvian images of forces are discerned. The overlapping strokes, mainly, work like tone reducing contrasts and luminaries. Some of the outline of form may thus remain so that other parts abhor the future they become way stations along the production paths. fermentation, they might to themselves a well to be labelled Paget and yield to their due. 99.1997
A LIBRARY of FORMS

A volume in heavy black & white has a different—more immediate—appeal, because it is more quickly seen, from one surrounded by an ambience of tone with its sense of light & atmosphere & even hint of color.

A solid rendered as a scientific geometrical projection may own a visual attraction, but speaks eloquently most of all to our understanding, while this cylinder invites the viewer—stroke by stroke—to assemble my construct for himself.

Yet their descriptive clarity, in every case, is owed to the same cause—the elements composing them are always geometric parts of the volume whole.

In addition, it will help us to put these elements in place, so that clear lights & darks will contrast the adjacent planes along the identifying edges bounding the faces of the pyramid & cube as well as the wall & upper circle of the cylinder.

The contrast at the volume-building edges is really most important, as without them the cylinder & cube would only be such planar shapes as those shown on the right.
Points To Keep In Mind

1. The square base of a pyramid shortens in perspective & will show a bit more width than height.

2. A pyramidal peak rises above the crosspoint of the diagonals, while a pit is lowered beneath them.

3. The pit may best be shown through emphasis upon the solid rim rather than the sunken point.

4. Especially along the forward edges of the peak, tones should grow in contrast as they close upon the point.

5. An adjustable tonal layout is begun, darker-ed as needed & its shapes made gradually firm.

6. Understand the demonstration—do not imitate.

J. G.
1992
Of the basic solids, this top view of the cone may be the hardest to articulate when light & shade are not employed to render the description.

Besides the line & tone, blank spaces are also geometric sections of the whole and join the others in delivering the reading.
The import of the basic geometric volumes may be better grasped when they ease the way to a wider range of subjects. Thus a plain right-angular solid could be transformed to yield the twisted shape in front, and knowing how spiral turns traverse the walls of cylinders could gain this set of steps.

Full understanding of these simple volumes is not given to the artist. For this would mean the power to construct their every variant & elaboration and may well elude even the most able mathematician. We likely therefore have to end each line of study at the point of surplus learning just beyond the needs of our visual work.
The latitudes & meridians of the globe render here the grid design.

The LAW of FORM ARTICULATION is not a rule of light & shade but of the geometrical accord of each part with the volume whole and serves us as a guide for treating all objects at once massive & detailed. It is thus ubiquitous & universal as well as easy to grasp. For even shape arrays of great complexity can only parallel, slant or curve against the grid divisions of a surface.

Thus to realize the visual shifting of the parts of shape—the curve, oblique & elements parallel to the grid design—within the perspective of a solid, is to own a potent tool for describing all forms in all possible ways.
Each grid causes increasingly small spaces to close upon the main intersection point. In this cone that point is nearest to the viewer, while in a sphere the nearest place is always at the center of the circular outline. Yet as designers, we may emphatically enlarge and heighten the shape display around either intersection. In the sphere this will mean that we bring into direct contact with the viewer a most telling though not the nearest feature. In the cone, however, the actually most near and also characteristic part is emphatically the apex and should be so described. It is of import that the shrinking spaces of these grids are not intended as a guide to an equal descriptive diminution.
These Oblique Cuts are Reversed Below.

Torus

Freehand Construction

J.G. 1995
The radius of these cross-sections may be resolved upon towards any reasonable measure.

In the daily work of drawing the whole of descriptive science is neither practical nor needed, so in large part we study to take action on the strength of our optical estimate alone.

The distant segment will be smaller than the near one.

Construction Shortcuts

J.G. 1996
THE INTERSECTION OF FORMS

Cylinder & Pyramid

Right Rectangular Prism & Cone

Freehand Construction

J.G. '95
You should try less elaborate intersections: a cylindrical chimney on a sloped roof, then straddling a sharp ridge & finally a rounded edge—the latter two combined at left. The graceful figure 8 of that last example may merit full transparency.

Freehand study

Construction may be rendered simpler with more parts left to estimate, particularly when transparency is not a desired end.

J.G. 1998
For this task, the Cube is seen as a 3-sided Pyramid.

Insertion of a Cylinder — Aligning with the Body Diagonal — into the Forward Corner of a Cube.

Freehand construction

J.G. 1995
The Top & Profile Views are drawn aligning each the other & introduce the forward Aspect on the bottom left. On the next edge my displacement advances through altering the Angles of the top & profile views.

5.5.95
Rotation at the Top & Tilting the Profile aspect of the Form produces Heights & Widths whose cross-points permit the drawing on the bottom left.

The INSERTION of a CYLINDER into the FORWARD CORNER of a CUBE at an Angle of 45°.

The foregoing page supplies the Top & Profile views used here & may help to clarify the work path I pursued.

J.G. 1995

freehand construction
The Asymmetrical Insertion of a Sphere into the Distant Corner of a Cube.

THE INTERSECTION of FORMS

Freehand study

J.G.
1996
A SPARE IMAGINATION THROUGH ACUTE OBSERVING

The play of light is varied, but all the shapes it makes have a trait in common. This trait is the accord of every element to the geometry of forms, so that any geometric parts of our own design can describe with equal clarity.

But a rule for showing form in all the ways that we may want teaches also that we are able to desire only what we can imagine, and this, all by itself, will be a finite reservoir indeed.

Light paints subtly a far richer shape array than the well-worn blending of shades & illuminated segments. Such subtleties are seldom visible to the untutored eye but can be discerned, intensified & re-composed in a wealth of variation our limited imaginings alone cannot bring forth.

Thus we go to nature—not to copy what she readily reveals—but to build for ourselves a storehouse of configurations we are not on our own able even to desire.

Through strengthening & coherently re-organizing what we have observed we carry out the artist's task of surpassing the material prototype—of creating better than his subject.

This drawing, it is hoped, may thus engage the viewer more persuasively than the vaguely white, translucent plastic cup that supplied the model.

J.G. 1997
The merit of the sparsely foliated rhyming here is that the "white" of my crushed page may be, at least uncertainly conjectured.

Form is described as persona: in-line as it is imprinted of tone.
Always, in ordinary drawing, we repeat this action: We first look at our object and then upon the page while laying down what we suppose we saw as best we can remember.

In **Contour Drawing** the artist only sees his page each time he sets his tool to give himself a start but never when it is in motion.

Contour Drawing is extremely useful as the most acutely concentrated means for observing and recording the detailed peculiarities of forms and one of our sharpest tools for exercising our drawing hand.

The results are often so engaging, we balk at acknowledging their limitations; however, they seldom deliver exactitude of structure & proportion. By nearly always looking at the object but rarely of the drawing surface, the artist may not succeed entirely at his task of page design. Thus the craft of fashioning—this product is not wholly our own. Instead, its beauty is a gift to us from a particular technique and not any due reward for our skill & talent.

After all the contours are in place, we may use a varied weight of stroke to accent attributes of import as well as those of special personal appeal.
In any truly exacting work of observation, Nature is able to surprise and delight us through disclosing her most elusive surface features in renderable, telling shape & clean-cut line. These features are Nature's open secrets, & she readily reveals them to sharp eyes & willing minds.

J.G. 1998

The drawings here are traced & hence adjusted to the page with care. This made possible improvements in their individual designs. But it brought besides slight weakening in the earlier sense of immediate, all but tangible engagement with the object.
The small Dodecahedron on the right supplies the plan for the Elevation View of the Sphere below.

To gain this Top View the upper Dodecahedron of the page before was given a 90° clockwise turn.

Exacting small adjustments at the perimeter for a more even outline, these two forms are scientific and could be built as solid volumes.
These studies are in finished form because they are intended here for others. As a rule such work is personal and will do its job if it makes plain his path of error and achievement to the artist author, so that my further effort at completion would normally be time ill spent.

The parallel strokes are a change of pace persisting in a sense of texture without the exact pattern.

In all manner of pictorial tasks the MINIATURE SKETCH, sometimes no larger than a postage stamp, will help to clear difficulties from the artist's path.
At right, unequal joinings of the parts convey the form. But light & shade are needed with the angle of regard less favorable. These at times obscure details in cavities while prominences become clear.

Light & shade can be implied by weight of line. Thus my point at depth is most times finely drawn & that at peak in bolder strokes.

Compare the flattening of the untreated line below with the effects of varied line at left.

freehand study

S.G. 2000
This sphere may not be built but can be drawn & seen.
Outlines are here-shaped to sharpen corners.
Shading sharpens edges, so that my solid will not be turned into a cavity through obscuring of the pattern.
One or two gradated steps may help to imply such patterns across empty space.
Mostly we substitute relatively larger, more practical & simpler repetitions for the actual elements making up a texture. The fuzzy globe below is least complex, hence a difficult to alter but also most instructive textural repeat. As rendered strokes are few & necessarily heavier than the hair-line they replace, on the page hereafter the least likely substitute expresses the desired texture by inclusion of the Dandelion leaf & flower as keys to the right interpretation of my pattern.

For a more coherent final margin small linear fragments are inscribed over the next to outmost circle of strokes. That aside, the texture arises — with but minimal adjustments — from the crosspoints of the geodesic globe above.
To see sculpture & to find it excellent the beholder assembles his eventual overall impression from at least subtly differing aspects. The draftsman & the painter must show volume solidly by composing an unalterable view, so that the created formal product is not as such the object but the entire page or canvas where the work is done.

A manner of close kinship with the natural world may grant the artist insufficient space of action to achieve this outcome excellently. Good design may here demand, besides ability, an apt or lucky choice of theme.

This near trompe l'oeil display may or may not give to me such luck. Mainly it completes my assembly of discoveries which can link a drawing to real objects of this kind. My entire table of such discoveries will be rendered on another page.

J. G. 2003
1. We see the bristles of a Chestnut Burr emerging into light from surrounding dark. In the foregoing drawing the white spaces must carry out this action.

2. Also, in that drawing, each rank displaces at the edge completely the rank of strokes which follows. In nature this is not how that overlap occurs. Instead, the outermost bristles which alone are seen in their unfalsified measure, join with the first ones inward as a united pattern of a density that seemingly grows sparser toward center.

3. The look of the repeat at the perimeter is the main key for reading what kind of texture we behold.

4. In nature the bristles strive away from the gloomy core. To link therefore the outer zig-zag spikes or single strokes to those with in - letting an association by proximity join with our recall of experience - such textures appear never painted smoothly on the surface as we see them on the right. For they must lift off, at least to a degree, from the limits of the core.

5. The tubing of the object, which may show forshortened circular path on which the textures travel or appear to travel, can serve to state the volume as a whole.

6. When a large part of a texture is obscured by tone the entire object tends to seem concave. Crisply separating lines slapping the volume overall can therefore serve the artist better; or tone may be used to describe such an object as a whole with texture showing only on the margin.

What we draw must never emphatically, that is, too visibly contradict these actualities. Yet rarely need an artist use every recognition signal known for any single work. Thus rendering abstractions which can make these forms & textures readable is a task we may very variously accomplish.
Below—a CHESTNUT BURR

The strokes are heavier & less numerous than we find them live; confinement within a shape lets them appear many, just as 20 people in a parlor would be a throng, yet all but lost on seas of pavement like St. Peter’s Square.

The shade section will not suppress all texture, but parts are caught by light. The fragmented tone above is therefore useful to render texture as well as the object overall.

F.G. 2004
The element of pliage on the page following is not much needed, there not helpful for the preceeding Chestnut Burr. But my other attempts became each more fully, a furry seed head when I place a stem & leaf beneath.
A sphere cannot divide into congruent geometric parts with equal spaces between intersections. But my right example approaches closer than the earlier variant. I must now discover if this plan will serve to place the uprights of my bristly ball & also, if there is a shorter path toward my desire.
No 69 is actually the last of the drawings. Soon after my eye-sight very quickly failed

J. v. G.
A technically right scheme as that above is seldom right design, yet the ruling plan of concentric circles & evenly spaced strokes below & used at right gives a visible beginning. Added strokes of estimated length cross the circles with the whole more readily adjusted for the eye than a wholly planless start.

F.G 2005
So far as I can tell, we may put observations to two uses: Oi lies in the particularities of shape & color play—the unrepeatably varied splendor of a unique relation of light to an array on which it falls.

The second reminds the viewer of observations he has stored within his mind, helping him to recognize a visually rendered object which resembles but is not the same as those which earlier have instructed him in nature.

Of more than half a dozen observations, I employ here the increasing density & length of the bristles outward & let them seemingly arise off the surface of the sphere. That arising is product of mostly slender & uneven fields of tone which, through describing roundness, show us volume & through open spaces repeatedly allow details of the texture to come through.

In this way, features observed in one place, by proving useful in related cases, can stimulate repeatable associations & constitute thereby fundamental lore.
While, by itself, the rendering in tone obeys no rule of science, the limits of the rectangle reflect accurately in the facets of the mirror. The picture is thus not the copy of an exact learning but the abstraction — & hence a derivation — from that learning. My drawing here, as do several others, wants to persuade that uncommon fields of study are not idle academic drills but open doors to creativities that, in ignorance, abide forever locked. Let us now find out what are the laws by which mirror images appear & how they can be drawn.
Refraction & Reflection yield broken rays of light. Because the eye sees only straight, it perceives the Image always in accord with the last part of the Light Path—the one connecting to the eye. But the image thus made visible is the perspective product of all the distances combined.

The law of the reversibility of the light path aids in rendering this diagram.

Regardless of the distance from the Mirror, the measure of the figure on it will be half the magnitude of the Viewer-Object.
Ripples on water are curves and hence infinitely many mirror planes at infinitely varied slants that are able to produce very long reflections.

The measure of the full reflection on the level mirror plane marks a signal change. For the object tends to reflect just behind the crest of wavelets beneath that place and increasingly diminished fragments.

Rippling may also spread reflections laterally, but in most objects not to a very visible degree. The sun reflecting as a million sparks is an exception & not the rule for a common dimmer thing?

Sight-Line seemingly passing through the level Mirror Plane?

Angle of Incidence & Equal Angle of Reflection

Parallel Sight-Lines all converging on the eye of an infinitely distant viewer.

The extended reflection

The object on the level Mirror Plane

Freehand study
This drawing is science only in essential part. By science, we may com-
prehend a natural event. But design is speech. It wants to be persuasive, even eloquent.
A mirror of mere common measure will only show cutout of the whole reflection.

MIRROR WALLS
set at a right angle

to each other

Right & left below resume their natural places.

The perspective of the floor grids puts the object in its right position every time.

freehand study
MIRROR OPTICS, REFRACTION, LIGHT & SHADE are each a class of study we may, besides delineating them from observation, seek to manage by descriptive geometric means & so invent a work from start to finish. This task of a sphere & mirror image is unsuitably complex to explain by it the rules that govern light.

Yet, once those rules, through easier demonstrations & assignments, have been learned, many such considerable difficulties can be mastered.

freehand study
This book assembles drawings of most varied kind, done with the ball-point pen. Some were multiplied and passed on as teaching aids to students. The greater number served purposes of analytical experiment and study and of showing what possibilities that learning delivers into reach. Others are just works of art seeking to carry into execution a creative wish.

Overall this collection seems the off-spring or a sequel of a more severely formal earlier work: The Formulation of a Graphic Language.

Johannes von Guntenenberg was born in Germany in 1931 and came to the U.S. in the winter of 1949-50. He studied Illustration at Rhode Island School of Design and Painting in Munich and at Yale – MFA, 1962. He has taught at University of Illinois, several years as head of Basic Design, and as department chairman at Kalamazoo College, MI.