

Promoting Conditions for Productive Accident

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COMPONENTS OF PRODUCTIVE ACCIDENT

Many successful students of architectural design find that their processes are characterized by *productive accident*: unintended relationships or visible consequences from which value is discernable. The phenomenon of discernable value is particularly apparent in iterative design work wherein a student may initiate several "false starts" only to double back upon earlier work in seek of previously unrecognized relationships.

Accidents are both prevalent and persistent in successful student design work. Immediately apparent examples of accident exist in the normal course of artifact production and might include collapsed models or torn drawings, things completed and then broken, or things begun and then left incomplete due to a student's failure to adequately anticipate time or resource limitations. This kind of accident may be understood as the failure of a product to conform to the requirements of an initial plan.

More subtle examples of accident exist (for example) in superimposition: two drawings completed to satisfy different or competing agendas may reveal through superimposition new and unintended spatial relationships; a model constructed at a certain scale may be placed into another model built at a different scale, revealing a surprising and otherwise unanticipated relationship of part to whole. This kind of accident – the kind which results from shifts in media – may be best understood as a consequence of students reconsidering and acting upon their own earlier work and asking questions of it in pursuit of value. As ideas are tested against new requirements and conditions, previously overlooked questions emerge in an unanticipated and occasionally productive fashion.

We have many responsibilities as architectural educators; among the most important and critical to success is our responsibility to help students develop their abilities to recognize accidents when they happen and to seek productive inspiration from them. For without these abilities, accidents will always remain a source of frustration and disappointment, and the success of design work will always be judged by how closely it relates to an initially stated plan. The specific risk of this is that by insisting on a consideration of their work with regard to their own initially stated intentions and plans, students could fail to find value in serendipitous discovery; effectively, *means* and *processes* would cease to be of academic interest, except in a linear and technical sense.

Questions concerning productive accident constitute my own pedagogical position within two courses which I teach at the university level, one an undergraduate design studio course, the other a seminar course open to graduate and undergraduate students. This paper comments upon general and specific attributes of work done in these courses in the past two years.

SEEKING VALUE IN ACCIDENT

Educators and most undergraduate architectural design students recognize with experience that accidents are an inevitable part of design processes, whether these processes are in the long run successful or not. However, early in their academic careers, many students are unprepared to discern productive value from their own experience, especially when things break or fail to develop according to plan. Such occurrences are often seen by students as failures, as mistakes to be hidden from other students and instructors, and certainly not as

evidence to which attention should be drawn at the expense of other more obviously successful parts of the design process.

In our Department of Architecture, we begin the first semester of undergraduate design studio with an implicit goal of helping students develop techniques for learning from their own iterative design work and to recognize the value in accidents when they occur. This goal requires us as instructors to establish studio conditions which can frame accidents not primarily as random, chaotic, and ultimately undesirable, but instead as productive and persistent sources of inspiration.

An early exercise in our students' first semester of design studio is called Stacking. We divide a total group of about one hundred undergraduates into teams of six students each. We give each team a fixed amount of full-scale building material consisting of dry-stackable masonry units such as concrete blocks or bricks, and a fixed amount of time (e. g. one hour) in which to configure the material into three distinct assemblies, each configuration exploring fundamental issues of masonry coursing and bonding with respect to the reach, position, and motion of the human body. The exercise is part of a larger first-semester studio curriculum designed to engage questions about relationships between the human body and architecture.

The Stacking exercise provides multiple opportunities for accident. First, because of the limitation, the students must work quickly, which in turn minimizes the opportunity for them to plan ahead; instead of planning and theorizing, the students necessarily focus their attention on lifting, stacking, and building. Similarly, the limitation on material forces the students to stretch their resources, often to the point of imminent collapse as they try to accomplish imaginable ends with limited means.

The Stacking exercise encourages the students to learn from accidents as soon as they happen. Working against the clock requires each team to quickly adapt their failed plans to newly (often painfully) learned realities of dry-stacked masonry construction. Repeated attempts ending in failure or even in collapse encourage the students to create masonry configurations which conform to the commonsense realities of the material. The dry-stacked material and its relationships to body and gravity take precedence over any initial attempts by the students

to be deliberately "creative" or "meaningful".

Following the Stacking exercise, the students shift their attention to individually produced scale models and drawings depicting larger-size masonry assemblies. As the students develop this new work over a period of several weeks, we as instructors repeatedly draw attention back to the full-scale work in the Stacking exercise. We remind the students of their own efforts to accommodate their own evolving work to shifted, accidental conditions, and of their developing ability to react productively as the operational reality changed in front of them. In general, the Stacking exercise is valuable because it emphasizes students' need to adapt themselves quickly and productively to accident. The specific value of the exercise to the overall semester-long course exists through memory of failed attempts and students' reaction to those failures.

Most students emerge from the Stacking exercise with an improved attitude towards accident: rather than seeking to hide or minimize accidental results in future work, they become increasingly ready to admit that accidents are an important opportunity for learning. At a minimum, most of them will react favorably to the suggestion that the Stacking experience (accidents included) provided them with a more full understanding of the properties of dry-stacked masonry.

PROMOTING CONDITIONS FOR ACCIDENT

Some students advance well beyond this initial and somewhat inconsequential recognition. Like others in the larger group, these students are prepared to recognize the learning potential inherent in accident – in this case, that they can develop a fuller understanding of a material by experimenting with it – but somewhat more forthrightly, these students realize that accidents which are recognized and confidently acted upon have the potential to add otherwise difficult-to-obtain value to their processes. And most significantly, such students begin to recognize that they can structure their own processes so that accidents are not only more likely to happen, but also so that their own abilities to recognize value from accident are deliberately tested.

We contend that architectural design processes may be understood, at every moment, as consequences of choices made by designers: choices which relate to design content as well as to representational

media. Choices about representational media are, in particular, fundamental to successful design processes because media are bound together with language and culture: they form the visual and operational language for architectural discourse. We believe that these observations are critical to the success of any project where students take responsibility not only for design content but also for the selection of media used to develop that content. The fundamental question becomes: to what degree are the choices we and our students make about representational media influenced by a desire to emerge with predictable results? Considered operationally, how do successful students go about structuring their own processes (e. g. through choices about the use of media) in order to promote productive accident?

These questions are a component of certain students' responses to the Stair exercise. In this exercise, we group our students into teams of four; each team of students is assigned two sets of stairs on the campus – one interior stair and one exterior one. We ask the students to measure and record each of the stairs with particular attention to the relationships which exist between their own bodies and the stairs. We require the students in graphically presenting their observations in plan and section to maintain a fixed scale and a fixed paper size. As part of the larger pedagogical goals, students are encouraged to focus their attention (in measurement and in drawing) on those components of the stair which respond to the reach, position, and motion of the human body.

What initially appears to most of the students to be a straightforward and linear exercise in measurement and documentation quickly becomes unpredictable and difficult because the stairs (as deliberately selected by the studio instructors) fail to neatly fit in their entirety on the given paper size at the given scale. This media condition requires the students to be selective: they find that from necessity, they are only able to draw certain conditions, volumes, and forms which they individually determine to be most relevant to the stated issues. As a consequence of editing out the less-important information, and of pushing previously unrelated components of the measured drawing into proximity or superimposition in order to fit the components on the page at the required scale, accidental relationships are developed. The final documents are characterized by superimposition of information and graphically

juxtaposed ideas. Relationships previously invisible or difficultly accessible are foregrounded.

This kind of work is typical of efforts to shift media to promote conditions for accidental relationships. Media shifts may incorporate superimposition (a plan is overlaid by a section), transposition (objects, spaces, or components are drawn in a spatial relationship which differs from their measured location), juxtaposition (drawings placed next to each other, heightening cross-influence), translation (shifting one's attention and efforts from one medium to another), inversion and reflection (a response drawing or model is produced to substitute black for white, or solid for void), shadow-casting (observing projected shadows from a solid model, either physically or digitally produced), or section-cutting (slicing multiple sections through a solid model and arranging them so as to develop cross-influential relationships). In the Stair exercise, as a consequence of the stated conditions and the need to fit components on paper, students tend to engage superimposition, juxtaposition, and transposition in their final work.

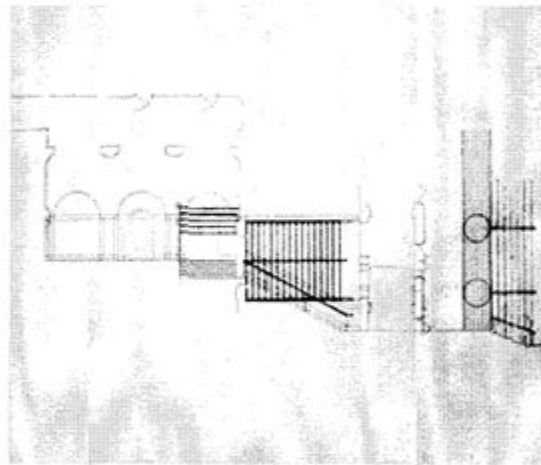


Figure 1. Stair at old campus library.

Two examples shown here, both of the main stair in the old campus library, use a $1/4" = 1'-0"$ scale on $17" \times 22"$ paper. The project shown in Figure 1 superimposes plan and section; the two drawings coincide at the point where the central guardrail ends at the top of the main stair. The work (without itself being symmetrical) is reflective of the composed, centralized approach from the building's entry portico to the upper-level atrium. At the center of the drawing, a sense of stair-as-room is height-

ened by the graphic coincidence of wall (in plan) with ceiling (in section). The drawing shown here is the result of an iterative process through which the student tested multiple respective positions of the superimposed drawings. This student's ability to learn from a media-shift-enabled superimposition – that is, from imposed conditions which heighten the likelihood of accidental relationships – proved of long-term value, as he was able, later in the semester, to extend the way-of-seeing he had developed in this project to an analysis of his own design.

The project in Figure 2 takes a somewhat wider view outward. This student's drawing engages the axially-placed monument across the street from the campus building, as a consequence of which she omits from her drawing the stair which the previous student treats centrally, compressing it instead to fit within a few inches of space on the left of the drawing. The upper-level atrium space is completely absent, though its edge is recognized. She superimposes behind her 1/4" = 1'-0" drawing a full-scale sketch of her own hand on the handrail, graphically coinciding with the point in section where she first grasps it as she ascends. The compression, transposition, and juxtaposition of elements within her work raises new questions about spatial relationships across the building's wide threshold. This work speaks less strongly than the previous example with regard to superimposition, but its attention to compressed space and juxtaposition of scale is significant. Again, as in the previous work, a media shift enables accidental (or at least previously unobserved) relationships to be foregrounded.

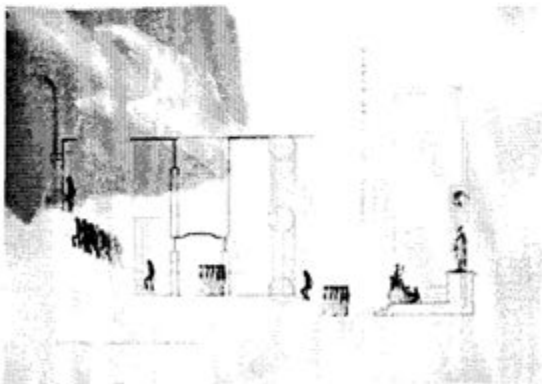


Figure 2. Stair at old campus library.

In general, students in the Stair exercise met with success as they shifted from initial (invariably

failed) attempts to fit the entire set of spaces and forms on the given paper at the given scale, into a mode of compromise (i. e. editing out architectural components which didn't participate in their understanding), and finally into a position of deliberate strength as new ideas and thoughts emerged from accidental superimposition, transposition, and juxtaposition. Because the final drawings are developed through a series of iterations, students are able to develop their abilities to remain alert for accidental and surprising relationships as they test and retest different combinations and superimpositions.

Specifically, we observe that the students who develop the ability to remain constantly ready for surprises and who are prepared to draw productive inferences from accidents when they happen are generally the most successful – not just in this exercise but in the semester as a whole.

SPECULATION ON ADDITIONAL EXERCISES

Shifting from self-reflective and documentary work into formal research demands of the students additional care and formal attention. In a three-week exercise for a seminar course in visual communication techniques, I ask students to thoughtfully combine and manipulate found documentation into comprehensive reflections upon the approach, entry, and important conceptual themes of a selected remote building, while embodying a stated point of view or thesis. The focus on found documentation (i. e. to the exclusion of students' own drawings) encourages intermixing and superimposition of media as well as reflection upon and prioritization between contradictory observations. I encourage students to use digital media to gather, organize, superimpose, and animate images and text into comprehensive, collage-like documents. The most successful projects are always those which transcend preconceived, compartmentalized understandings of discrete media, projection techniques, and univalent concepts.

In a previous semester, I chose Peter Zumthor's Kunsthhaus in Bregenz, Austria as a study building. The student work shown in Figure 3 consists of sampled images of the Kunsthhaus set within a compositional framework suggesting the building's exterior facade. By refusing to allow the sampled images to bear a direct compartmentalized relationship to (for example) reflections within the facade or views through windows, multiple readings are

strengthened: the two sides of the work are read as day-night, outside-inside, and without-within. Initial readings are complicated by the realization that the small images are themselves alternately positive and negative. What might otherwise have been a simplistic, dogmatic reading becomes suggestive, skeptical, and productive: the work raises questions about the facade and the volumes and views it defines. In this example, intermixing, superimposition, contradiction, reflection and prioritization of found documentation enables multiple readings of the architecture.

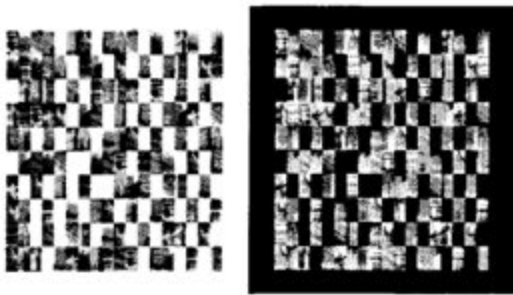


Figure 3. Analysis of Kunsthaus Bregenz.

This kind of exercise is important to building student confidence in dealing with accident because it places heavy reliance on accidentally developed relationships. Precisely because students are limited in source material, they must rely on their own abilities to blur, sharpen, invert, fold, wrinkle, break, cut, combine, distort, enlarge, reduce, erase, separate, force together, shift, transpose, trace, transfer, smear, stretch, and tear the found documentation as a means of moving it forward in pursuit of value. In other words, successful students will attempt to heighten or promote conditions in which accidental relationships are encouraged.

A similar exercise which I propose to develop in a future semester will require the students to cut photographs into strips, rearrange the strips, and respond to the new configuration with line and tone drawings. In this exercise, I expect that the accidental relationships developed through shuffling and rearrangement of found documentation will heighten student focus on seeing and drawing rather than on an inference of meaning or a "naming" of objects. In a previous exercise, in which I asked the students to respond to a given photograph

with a series of tonal light-stratification drawings, students betrayed a common tendency to identify objects within neutral tone at the expense of a fuller understanding of light within space.

CONCLUSION

Designers and students who fail to remain alert for accidents in their processes, and who remain unable to draw productive inference from accidents when they occur, are at a fundamental disadvantage with respect to those who are prepared for the unexpected. The most productive students are those who not only recognize the potential of accident (i. e. by willingly abandoning preconceptions and finding value in unintended results), but who learn how to push their work to places where accident is likely to happen.

Limitations, such as those deliberately imposed in the Stacking exercise with regard to time or material, or those in the Stair exercise with regard to media size and drawing scale, can productively act as conditions which heighten the likelihood of accidental relationships. Media shifts, as observed in student responses to the Stair exercise and the found-documentation work in the visual communications seminar course, are seen to be effective means for students to promote and develop those relationships.

Students productively exposed to accident, collapse, breaking, and failure are inevitably better equipped to recognize value in the unintended; as a result, their ability to navigate the unfamiliar and to make sense of complexity is strengthened. Because I believe that intelligence can be defined as the ability to meaningfully interpret unfamiliar information, I rank those students who repeatedly show that they can deal productively with accident as among the best and most intelligent students.

NOTES

Figure 1. Student work produced by Aaron Taylor, Fall Semester 2004.

Figure 2. Student work produced by Sarah Stratton, Fall Semester 2004.

Figure 3. Student work produced by Dan Elias, Spring Semester 2004.