

shape. This is possible because specific kinds of actions can be seen to have characteristic slopes or curves.

### Conventional Kinds of Action

Figure 3.6 indicates five types of action, using Freytag's terms for them. These "anatomical parts" of a play have been redefined and renamed by nearly every critic since Aristotle. Today, most drama students learn a set of conventional categories and a less symmetrical (but still schematic) characteristic curve for dramatic action, shown in Figure 3.7.

The *exposition* (segment a) is the part of a play that functions to reveal the context for the unfolding action. It formulates potential into possibilities, introducing characters, environments, and situations. Exposition as the revelation of information continues throughout the play, but it diminishes as the action progresses; it becomes less and less necessary or appropriate to introduce new potential. The *inciting incident* (point b) is actually a small segment rather than a point (since it has some duration); it is the action or event that begins what will become the central action of the play. On the graph, it is the point at which the curve takes its first significant upward turn. In terms of the "flying wedge," the inciting incident initiates the first lines (vectors) of probability. The *rising action*

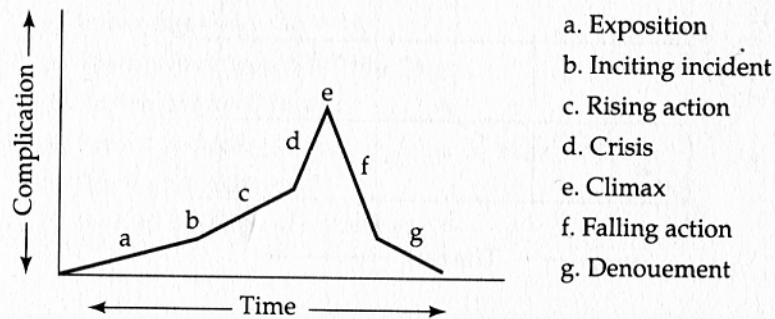


Figure 3.7 A more contemporary version of the shape of dramatic action and its conventionally recognized parts.

(segment c) follows the inciting incident. In this portion of the play, the characters pursue their central goals, formulating, implementing, and revising plans, and meeting resistances and obstacles along the way. At some point, the action "goes critical"—that is, characters must make major decisions and take conclusive actions in pursuit of their goals. The *crisis* (segment d) is a period of heightened activity and commitment, and it usually proceeds at a faster pace than the preceding action. During this segment, many lines of probability are pruned away. The *climax* (point e) is the moment at which one of the lines of probability becomes necessity and all others are eliminated. Characters either succeed or fail to achieve their goals. This key incident is the turning point of the action. The *falling action* (segment f) represents the consequences of the climax, as they reverberate through character and situation. The slope of the falling action is characteristically rather steep; that is, things tend to fall into place quickly once the climax has been reached. The *dénouement* (segment g) can be described as the return to "normalcy" (the *status quo* of the dramatic world). In French, the word means "untying" or "unraveling." The dramatic potential is exhausted; its intrinsic energy has been used up by the action.

If we were to enlarge any segment of the graph for a real play, we would see (depending upon the resolution of the underlying analysis) still more bumps and curves, representing the structure of the smaller component incidents that make up the larger anatomical parts. The exposition of a play, for instance, is made up of a number of incidents that reveal information with varying c/t values. The rising action is composed of smaller incidents that tend to have a higher average slope than incidents of the exposition. Here, a fractal metaphor is apt (and perhaps it is more than a metaphor): The smaller components of a given type of action tend to reflect its structure in miniature. The overall graph of any given play is like its fingerprint; it is unique. An intriguing pastime for the quantitatively inclined is to observe how these fingerprint curves are reflected in the smaller incidents that make up larger anatomical parts. Plays can be seen to employ structural

patterns in the same way that music employs themes and motifs.

An important thing to note about this analytical technique is that it reveals a major source of a play's aesthetic appeal; that is, it provides some explanation of why a play *feels good*.<sup>5</sup> As Aristotle's analysis of the qualitative elements of structure (discussed in Chapter 2) suggested, *pattern* is a powerful source of pleasure. Designers of human-computer activities can borrow concepts and techniques from drama in order to visualize and orchestrate the structural patterns of experience.

It is relatively easy to see the relevance of orchestrating the shape of action in story-based human-computer activities like computer games or interactive simulations. But what about more pragmatic, "computer-like" activities—say, spreadsheets? Both Heckel [1982] and Nelson [1990] have extolled the virtues of VisiCalc and its descendants. Heckel identifies one source of the product's appeal as the immediate representation of the effects of users' actions: "While entering formulas, the user is continuously stimulated. Similarly, when changing a number, the user is stimulated by the effect of the changes as they ripple through the spreadsheet" [Heckel, 1982]. This source of a good spreadsheet's appeal can be visualized as a Freytag-style curve. Let's say I'm using a spreadsheet to decide whether I can afford to buy a new house. Referring again to Figure 3.7, the various segments of the graph might correspond to the following actions:

- a. *Getting started.* I enter the price of the desired house, the price that my current home is likely to fetch on the market, and any additional numerical data that I might have, such as interest rates, property taxes, and the costs of utilities.

<sup>5</sup>An interesting exercise in scientific (or artistic) visualization would be to create first-person versions of such graphs, so that one could experience them kinesthetically by "riding the curves." Would such abstractions *feel good* in and of themselves? If we represented them audibly, would they sound like music?

- b. *Preliminary evaluation.* I discover that the new house, in terms of the data already entered, will cost me \$1,000 more per month. Things are looking bad, but I really want to be able to afford the house, so now I am going to start trying to think of things that will turn the picture around. Thus the "inciting incident" is the initial set of calculations, which leads to my decision to pursue a new goal: to make the numbers support the desired outcome.
- c. *Entering new data and formulas.* Are there tax benefits that derive from the interest rates and increased debt? How will my utility bills change if I replace the new house's electric heating system with a gas furnace? I try different strategies with positive and negative effects.
- d. *Making major trade-offs.* Things are still looking bad to iffy; now it's time to decide what sacrifices I am willing to make. Finally I decide that I can live without a new car, that I can forgo furniture in the living room, and that I can borrow an additional chunk of down payment from my mother. Will any or all of these sacrifices be sufficient?
- e. *Making the decision.* I "turn the crank" by implementing each of these sacrifice scenarios in turn and then in combination until I arrive at one I can live with. Yes, there is a way to afford the new house.
- f. *Creating an artifact.* I clean up the spreadsheet, do a little formatting, and print the whole thing out to show my husband so that he, too, will be convinced.
- g. *Finishing up.* I save the document and exit the application.

The spreadsheet illustrates how the conception of the application and its functionality shapes the action by providing elements of form. It also shows the way in which the application and the person collaborate to create a whole action with an interesting shape. It illustrates the fact that an