Close observers of the theater scene such as Carol Rocamora have diagnosed that “science is becoming the hottest topic in theater today, so much so that it’s identifiable as a millennial phenomenon on the English-speaking stage.” In line with Rocamora’s observation, the following maintains that Science Plays form a distinct dramatic sub-genre which has identified the natural sciences as an area to serve in a very rewarding way as both, a thematic and a formal resource, providing fresh chances to link artistic expression with social relevance.

In his 2002 survey article “The scientist on the stage“ M.A. Orthofer still stated that a “notion of incompatibility between science and theater remains deeply ingrained.” And some five years ago, I set out to prove the contrary. Taxonomical attempts to clarify what Science Plays are have come basically from four different intellectual directions or sources: scientists-turned-playwright, science historians, theater scholars, and performance scholars. And it is precisely these groups which contest the field of Science Plays, dispute the qualitative superiority of one dramatic form over another, and disagree vigorously over the question as to what constitutes a ‘good’ Science Play. The explanation for this disagreement and incessant struggle lies in the conflicting aims and principles employed. And it is therefore of vital importance to attempt a taxonomical differentiation in order to
clarify and separate the diverging scholarly positions, to strive for recognition of the multifaceted and qualitatively rich area of Science Plays.

The following argues first, that Science Plays form a rainbow-colored dramatic sub-genre. Secondly, any (working) definition or attempt at portrayal should operate as an umbrella term, since Science Plays are a heterogeneous group where both form and function vary decisively. The single characteristic which binds all Science Plays together is their use of realistic or real science, in clear contrast to science fiction. Fourthly, it is of central importance to stress that Science Plays are text theater and not director’s theater. They rely on the spoken word on stage, on dramatic dialogue, and not primarily on the bodily performance in order to convey meaning. Therefore, a drama studies approach provides the most practical tools to highlight and describe differences or similarities in topic as well as form. Moreover, it is through close readings of the dramatic texts that the subcutaneous levels of meaning can be detected.

The chemist-turned-playwright and “Mother of the Pill” Carl Djerassi has provided a very useful label, “science-in-theater,” which comprises four constitutive elements: first, accurate description and representation of the scientific idea or theme, second, realistic depiction of the tribal culture of the scientists, third, a plot which is firmly rooted in the scientific topics and/or context, and finally, a didactic element. My close scrutiny of more than sixty plays has revealed that one or the other of these elements tends to predominate, so that two subdivisions for “science-in-theater” can be postulated.
“Docere et Delectare” plays focus on a scientific topic which is being didactically illustrated and ‘taught’, for example ICSI or ‘neurology 101’. Playwrights such as Djerassi have repeatedly stressed that they wish to inform their audiences about ‘facts’, deliver the background knowledge first, and then ask questions, but without providing answers. These plays comment more about the here and now, with a look towards the future, the potential development of scientific research, the respective consequences for society and the world at large and the way our lives will be lived, than about the past.

A second, much larger group, “The Tribal Culture of the Scientists, Then and Now,” highlights more the tribal community of the scientists, and here again, with different emphases and different ‘messages’. The general audience learns what characterizes the individual scientist and the scientists as a group, guides their thinking and behavior, makes them tick, or what constitutes the underlying fascination of the scientific endeavor. The social and cultural influence of science comes to the fore, and the plays ask us to consider our attitudes and opinions. Here, the past is just as rewarding as the present to draw a line of continuity from previous centuries to today. Paradigmatic examples are Einstein’s Gift and An Experiment with an Air Pump. In the latter, two time lines are used to illustrate that the general behavior of the scientists, the strife for priority and recognition, is identical in the 18th century and today.

In both cases, whether in plays subsumed as “Docere et Delectare”-plays, or in “The Tribal Culture”-plays, the audiences are invited to cross the threshold into new territory and learn more about the natural sciences and their practitioners. These
dramatic works open the doors of the ivory towers and bring science closer to the people.

The following discusses a “Docere et Delectare”-play, On Ego, by Mick Gordon and Paul Broks (2005).7 “[H]ow does meat become mind?” “How does the brain construct a self?” (18f.) These are the crucial questions raised by On Ego, which bears the sub-title: “A Theatre Essay.” For the last decade, Mick Gordon and his company “On Theatre” have been developing the concept of “theatre essays” with projects such as On Love and On Death. On Ego follows exactly in this vein as a collaboration with the neuropsychologist Paul Broks.8 To add on the title page that the play was “inspired by the book Into the Silent Land by Paul Broks” is a slight understatement. Entire passages, not to say chapters, have been incorporated verbatim into On Ego, for example the teleporter plot (see below) conforms to a large extent to Broks’ chapter “To Be Two or Not to Be.”9

Apart from the dictionary definitions of “theatre” and “essay,” provided in lieu of an intellectual epigraph, defining features of the concept “theatre essay” are wanting. What can be deduced from On Ego’s plot and format is that it is supposed to address specific elements of man’s nature through a fusion of scientific lecture with dramatic action. Despite the unique label, the allegedly idiosyncratic way of presenting drama on stage is exceedingly reminiscent in aim, form and scope, of Carl Djerassi’s already well-established “science-in-theater” category. Applying the parameters contributed by Djerassi, astonishing similarities become evident. In the “theatre essay,” science, here neuroscience, is at the core of both theme and plot, the science being described is ’real’, both, science and scientists, are realistically
depicted, and, finally, the didactic element of explaining a scientific context features prominently. The publisher Oberon has advertised the play as “part of a groundbreaking series of theatre essays, which use theatre as a way of exploring the fundamental preoccupations of modern life.” In how far these so-called “theatre essays,” utterly unspecified in their characteristics, differ from “science-in-theater” remains obscure. “Theatre essay” provides yet another label, the substance underneath however reveals no “groundbreaking series,” but rather total conformity with category of “science-in-theater,” already established years ago. Since clear definition or differentiation is sorely lacking, gentle integration into this genre is a certainly painless, and definitely reasonable undertaking.

The play consists of nine scenes and features three characters: Alex, a lecturer in neurology in his mid-thirties, Alice, Alex’s wife and an interior designer by profession, also in her mid-thirties, and Alice’s father Derek, a professor in his late fifties and Alex’s co-worker in the lecture scene. The plot follows two strands: the love-relationship between Alice and Alex, dominated by the diagnosis that Alice suffers from a brain tumor, a butterfly glioma, which gradually deprives her of mental capabilities such as naming animals or the day of the week, or remembering numbers and nouns. Furthermore, she develops the so-called Capgras Syndrome:

The delusion that someone you love [in this case Alex, Alice’s husband] has been replaced by another who looks and acts the same as the original but with whom the sufferer feels they have no emotional connection (53).
What complicates the story and adds some additional narrative spice is the second storyline, a scientific lecture combined with a thought experiment. The opening of the play coincides with the beginning of Alex’s lecture on neurology, the theater audience thus turns into his addressees, a fact which is not immediately apparent. Alex aims to illustrate the non-existence of the Ego behind the “animated device attached to the outer surface of a bony box,” namely the face. “Behind every face – we think – there is a self. An essence, an ego, an ‘I’. […] The fact is there’s nothing but material substance: flesh and blood, bone and brain” (16f.). Alex, assisted by Derek, stages a thought experiment so that the audience may side with either the “bundle theorists” or the “ego theorists.” They employ the science-fiction device “teleporter” which can scan and vaporize the human body at one place and reassemble it at a different destination, reminiscent of the Star Trek “beamer” contrivance. Would we, as audience or readers, dare to use such a teleporter? Bundle theorists might, since they believe that we consist of nothing but “a complex fluctuating pattern of physiological and mental states, nothing more” (22). Ego theorists would certainly refuse to utilize the device, since the vaporization of the body would forever destroy the irreplaceable ego, the unique ‘I’.

During the performance of the experiment, the machine malfunctions. Alex teleports to dinner with his wife, but does not simultaneously vaporize in the teleportation chamber. Alex is thus duplicated, and one ‘version’ needs to be destroyed. In Derek’s words: “we recommend that the existence of surplus individuals be discontinued” (37). Which ‘Alex’ is the ‘real’ Alex? Would the destruction of a duplicate constitute murder?
The two narrative levels of the thought experiment in science-fiction format on the one hand, and realistic action on the other, blur to such an extent that we as audience or readers can, at a certain point in the action, hardly distinguish between ‘fiction’ and ‘fact’. At this point, where a theater audience or a first time reader may be drawn into the clever vortex of the play’s structure, the science fiction element might threaten the play’s inclusion into “science-in-theater,” which is clearly set apart from science fiction. In Scene Four, the two levels appear to blend. Alice and Alex are having dinner at a restaurant, celebrating their wedding anniversary, and Alex is at the same time talking to Derek in an attempt to figure out the consequences of the failed teleportation. Yet, it is very important to note that the dialogue alternating between Alex and Derek, and Alex and Alice, reveals that the former conversation is taking place in Alex’s mind. Alice keeps talking about their dog, while Alex is preoccupied with thinking about Derek’s potential reaction, culminating in the revelation that he, Alex, is the surplus ‘Alex’. And Alice has to bring him back ‘to reality’, as it were: “Alex? […] You’re miles away” (40). Which, if the teleportation story were true, would actually be quite correct; one version of him would indeed be miles away, in the teleportation chamber. As Derek puts it: “It’s just a story. A parallel fiction” (47).

Alice, suffering from Capgras, believes that ‘Alex’ is no longer the Alex she has been married to: “…that man, that thing, is not Alex inside” (53). If the teleporter were real, Alice’s hunch would prove to be true. However, since teleportation is merely part of a thought experiment, Alice’s perception clearly indicates her mental illness. This fusion of reality, i.e. science, and imagination, i.e. science fiction, illustrates the thin line between mental health and mental illness.
After the “scientific lecture,” in the course of which we have seen a video of a brain operation, various images of brain scans and interconnecting neurons (17), and even a ‘real’ brain as “special effect” brought on stage in a bucket and held up by Alex, the lecturer (18f.), we begin to question our – obviously naïve and false – assertion of possessing an ego, an ‘I’, a self. The lecturer Alex recites Francis Crick’s “Astonishing Hypothesis,” which is also projected onscreen:

…that “you”, your joys and your sorrows, your memories and your ambitions, your sense of personal identity and free will, are in fact no more than the behavior of neurons. That conscious experience is not caused by the behavior of neurons, it is the behavior of neurons. (18)

And Alex paraphrases this insight once more: “Our actions and experiences are not owned by some inner essence. Actions and experiences are all we are!” (19).

“Ego theorist” or “bundle theorist” (20) aside – the basic problem with the play, just as much as with Broks’ book Into the Silent Land, is the dominant taste of the pop-scientific; the forced attempt to fuse belles lettres with scientific lectures, Emily Dickinson with Francis Crick. And it turns out to be even more annoying that Broks has misquoted Dickinson in both, his book and the play.15 As Alex has it: “There’s nothing like God to fuck up a poem” (35).

Here, science is not smuggled on stage, but features very prominently, presented through the well-worn device of a scientific lecture, thus reducing dramatic
dialogue and plot. Alex says about the brain: “There is no ghost in the machine… just a machine” (17). We might be tempted to conclude in a similar vein: there is no identity in the play, just a play. “No essence, no ego, no ‘I’.” However, an even closer look reveals that the entire play consists of the single mental rumination of one individual person, transferred into visible stage action.

Maddy Costa has recognized a particular strength of the play in the fact that the plot does not only grapple with, but is driven by “the complex questions about the nature of self, ego, and consciousness.” And it is just this mixture of ‘realistic’ physical plot and mental images which supports this tenet. “The self is a story” (20) – and who tells the story of the self? This question can also be applied to the plot as such: “we come together in a work of fiction. Our brain is a story-telling machine. And the ‘self’ is a story” (20). The play itself is a story told by another, Alex’s brain, featuring the characters Alex, Derek and Alice, coming together in a work of the imagination which is again told by the two authors Gordon and Broks.

Scene Nine reveals the play’s ultimate nature through a “brain soliloquy,” mixing Alex’s inner and outer voices (68). “I am the story” (71f.); the story of a neurologist, grappling with his scientific belief that there is “no essence, no ego, no ‘I’,” in view of the inevitable demise of his beloved wife, who certainly is much more to him than just a bundle of neurons; an essence, an ego, a unique ‘I’.

Science Plays in their interdisciplinary and cross-cultural nature are a vivid genre and deserve broad(er) attention and funding. At the beginning of the 21st century, there do not exist too many topics apart from man in a scientific world which
(should) concern us to make our future safe. In both fields of research, science and Science Plays, much ground is left uncovered and demands further research and scholarly work.

My study *Science: Dramatic* aims to highlight the diversity of ways and means in which science is being employed, reflected and represented on the theatrical stage, as well as to point at the different aims and ‘messages’ pursued by contemporary dramatists through a taxonomical differentiation. It opens up one perspective on the field and defends Science Plays as a distinct, versatile genre which warrants further scrutiny.

If the theater survives as a “laboratory for cultural negotiations, a function of paramount importance in the plurivocal and rapidly changing contemporary world,” the sub-genre of Science Plays will surely expand, and hopefully more commercial theaters will provide them the space they require and deserve. Science Plays fuse the most suitable artistic format with socio-political and cultural topics which are of tremendous significance for the decades to come. The public space of the stage is the ideal site for all the mandatory negotiations and discourses on our future. It is to be hoped that this study generates fruitful discourse and contributes to the further elucidation of Science Plays. “Wir wissen bei weitem nicht genug [...] Wir stehen wirklich erst am Beginn.” We are really just at the beginning.
Eva-Sabine Zehelein

Goethe-University Frankfurt / Main (Germany)

American Studies Department

Grueneburgplatz 1

D-60323 Frankfurt

zehelein@em.uni-frankfurt.de

1 Carol Rocamora, “Scientific Dramaturgy,” The Nation 5 June 2000; 50. Rocamora is adjunct professor at New York University’s Tisch School of the Arts.


3 Cf. e.g. Carl Djerassi, “Science on Stage,” in This Man’s Pill. Reflections on the 50th Birthday of the Pill, ibid. (Oxford: Oxford UP, 2001): 244-279.


7 Mick Gordon and Paul Broks, On Ego. A Theatre Essay. London: Oberon, 2005; 17. All further references to the play are given in the text in brackets. On Ego has been optioned for a motion picture and therefore no full productions of the play can take place in America. Cf. anon. “Science meets the human spirit in reading of On Ego.” MIT Tech Talk, 15 November 2006; 7.

8 Paul Broks, Into the Silent Land. Travels in Neuropsychology. New York: Grove, 2003. Broks, trained as a clinical psychologist at Oxford University, specialized in neuropsychology, and is Senior
Clinical Lecturer at Plymouth University. *Into the Silent Land* was short-listed for the Guardian First Book Award.

9 Cf. *Into the Silent Land*. 204-225.

10 Cf. the back cover of the book version.


13 The information is provided much later, in Scene Four, when Alice asks Alex: “How was the lecture?” (31).

14 This quotation reappears in the course of the plot, cf. p.41; slightly altered on p.66.

15 He quotes: “The brain is wider than the sky;” the misquotation appears in line three. According to Thomas H. Johnson, ed. *Emily Dickinson: The Complete Poems* (London: Faber and Faber, 1975: 312), it should read: “The one the other will contain” instead of “The one the other will include.” Epigraph to *Into the Silent Land*; in *On Ego* on page 34. In the play, it is Alex who recites the poem, and thus, a slight inaccuracy might be excused.


17 See also similar phrasing on p.49 and again in the course of the “brain soliloquy” (Scene Nine), p.71.

