EINSTEIN: The Gourmet of Creativity

In an extraordinary personal account of how he developed the general theory of relativity, Einstein demonstrated that only a few can have their cake and eat it too, says a psychiatrist who analyzed the document. The result is a classic example of "Janusian thinking."

BY JOEL GREENBERG

A "great leap" in creative thought, such as that represented by Albert Einstein's general theory of relativity, has been attributed to many things — extraordinary intelligence, altered states of consciousness and a variety of "special" thought processes available only to geniuses. Unfortunately, many such explanations have been limited to conjectural theory because few creative geniuses ever actually described — at least in public — the detailed, personal thought processes leading to their discovery. In 1953, Einstein said: "I know quite certainly that I myself have no special talent. Curiosity, obsession, and dogged endurance, combined with self-criticism, have brought me to my ideas. Especially strong thinking powers ('brain muscles') I do not have, or only to a modest degree. Many have far more of those than I without producing anything surprising."

But in 1919, shortly after his formulation of the general relativity theory, Einstein penned a document that went undiscovered until after his death and remains unpublished today. A portion of that document contains a startling and perhaps unique insight into the evolution of a great leap in creativity. "This document provides a direct and detailed account by Einstein himself of the actual thinking that led to his discovery of the crucially important general theory of relativity," says Albert Rothenberg, professor of psychiatry and behavioral sciences at the University of Connecticut Health Center.

"As far as I know, this had never been done by any creative scientist before," Rothenberg said in an interview. "The very existence of the document is a dramatic event in itself." Others, such as evolutionist Charles Darwin, mathematician Henri Poincaré and chemist August Kekulé, have provided descriptions of their thinking, Rothenberg says, but to a much lesser extent. "No one to my knowledge has spelled out [their creative thoughts] to this degree and in this detail."

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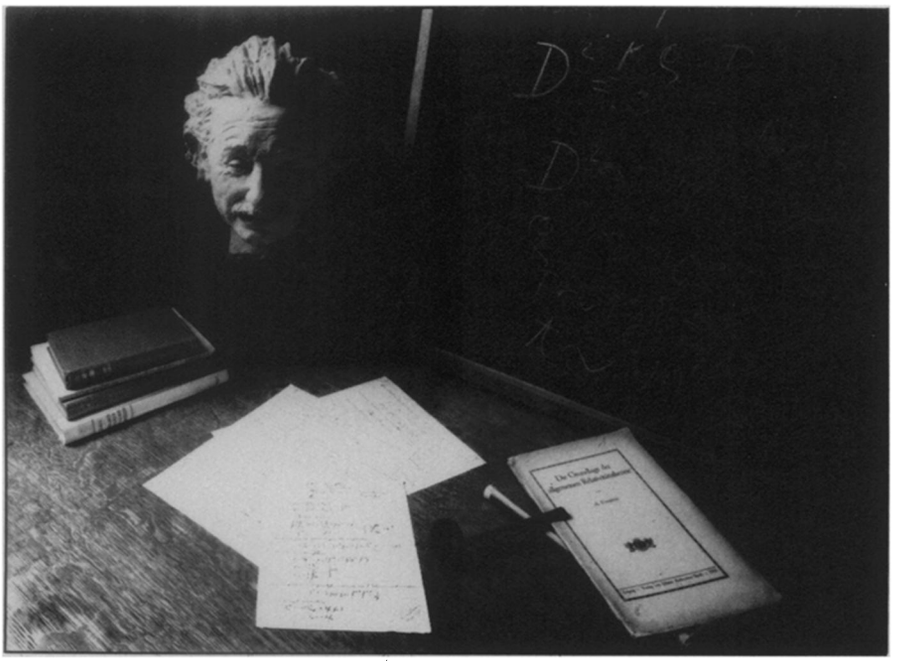
Einstein is shown in a pensive mood here in 1921, about two years after writing about how his creative processes led to the general theory of relativity.



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Rothenberg published an English translation (by Gerald Holton) and interpretation of the German-language document in the January AMERICAN JOURNAL OF PSYCHIATRY. Einstein's account not only "clearly specifies ... for the first time" the creative leap responsible for his theory, but it also represents perhaps the most classic example of what Rothenberg believes is a universal process of creativity: "Janusian thinking."

Based on the Roman god Janus, whose multiple faces were turned in several opposite directions at once, the Janusian thinking concept is the result of more than 1,665 hours of Rothenberg interviews with creative people in the sciences and arts — most of whom had achieved some major honor or award — plus content analyses of reports and manuscripts. The psychiatrist first defined the idea in 1966 after analyzing Eugene O'Neill's play "The Iceman Cometh" and interviewing O'Neill's widow.

"Janusian thinking consists of actively conceiving two or more opposite or antithetical concepts, ideas or images simultaneously, both as existing side by side and/or as equally operative or equally true," Rothenberg explains. "In apparent defiance of logic or matters of physical impossibility, the creative person formulates two or more opposites or antitheses coexisting and simultaneously operating, a formulation that leads to integrated concepts, images and creations."

Janusian thinking is usually a "crucial step" that occurs at a "moment of inspiration" during the process of creativity, he says. In his 1919 writing on the development of the general theory of relativity, Einstein, astoundingly, identifies "the happiest thought of my life ...:

"Just as in the case where an electric field is produced by electromagnetic induction, the gravitational field similarly has only a relative existence. *Thus for an observer in free fall from the roof of a house there exists, during his fall, no gravitational field* [Einstein's italics] — at least not in the immediate vicinity. If the observer releases any objects, they will remain, relative to him, in a state of rest, or in a state of uniform motion, independent of their particular chemical and physical nature. (In this consideration one must naturally neglect air resistance.) The observer is therefore justified in considering his state as one of 'rest.' ..."

The idea that someone or something can be in motion and at rest at the same time clearly illustrates that "Einstein knowingly formulated a condition of simultaneous antithesis," Rothenberg says. "In ordinary experience, falling or being in motion and being at rest are completely antithetical. He [Einstein] therefore devoted several sentences to explaining the particular considerations allowing the moving observer to — as he states twice — 'consider his state as that of rest.' As Einstein knew, it was a rather shocking and dramatic breakthrough." This "great leap" of thought constituted "the key creative step [toward the general theory] ... of finding a way to connect gravitation to relativity on the basis of empirical or physical reality," Rothenberg says. "This key step was formulated all at once as a simultaneous antithesis."

This is a prime example of Janusian thinking, he says, and differs markedly from most other interpretations of both Einstein's thought processes and creativity in general. "Because of Einstein's gentle and somewhat introverted personality and because visual thinking [which Einstein reported experiencing] is often erroneously considered more primitive and more characteristic of childhood than verbal thinking, some have asserted that Einstein thought as a child thinks," says Rothenberg. "This ... roughly coincides with many psychoanalytic formulations about creativity that postulate the regressive, primitive roots of creative thinking."

But the 1919 Einstein account — formally titled "Fundamental Ideas and Methods of Relativity Theory, Presented in Their Development" — clearly demonstrates that "there was nothing primitive, childlike or regressive in the creative leap," the psychiatrist says. "Absent from the account are any suggestions of an altered state of consciousness or the intrusion of ego-alien material. ... Einstein was fully aware of the logic and reality of the issue at the moment he had, in his words, his 'happiest thought.' He did not magically conceive the equivalence of opposites." Einstein's visual concept of a person falling from a roof involved not a regressive, primary process visual imagery, he suggests, but "another type of high-level creative thinking."

Moreover, Janusian thinking appears to be a common path of creativity and "is not at all merely a manifestation of" other creativity theories such as divergent thinking, bisociation, lateral thinking or the bringing together of remote associates, Rothenberg asserts. "It is a directed thought process involving active formulation rather than association or bisociation," he says. "Moreover, it involves active espousal of specifically antithetical or oppositional entities, rather than only divergent or 'lateral,' unrelated or remote ones ... it is a logical postulating of what, on the surface, seems illogical."

The "everyday person" may be able to appreciate such a concept but "really [does] not deal with it," he says. The average person may have "naive hopes that they can have their cake and eat it too — but they never make it logical and feasible. This form of thinking [is] apparently unique to creative people."

Rothenberg reports that his studies and interviews show Janusian thinking is evident in the creation of poems, novels, plays, painting and sculptures as well as of scientific theories and discoveries. But it is Einstein's own account that is perhaps the strongest evidence of the existence of this type of thinking process, Rothenberg says.

"Einstein seemed concerned with opposition in a large way throughout his thinking in his lifetime," he notes. "As Einstein's exposition now makes clear, the key thought allowing for the formulation, the creative leap giving his incomplete ideas a physical basis and bringing them together in a meaningful formulation, was the specific conception of opposites operating simultaneously — an observer being in motion and at rest at the same time. The creative person actively brings together opposites and antitheses as a means of formulating scientific and other problems, initiating and facilitating aesthetic tasks, creating theories, making discoveries and constructing works of art." □