During the summer of 1837, Charles Darwin began a page in his brown leather-bound notebook with the sentence: I think. The page was in the first of four notebooks that he had started in London dealing with the question of species change. However, his thoughts were not explained in words, but in a fist-sized diagram: from an origin designated with the number 1, a line shoots out and then branches off in three directions. One branch leads nowhere; the other two fan out further and further in all directions. The lines that fan out form a fragile and irregular structure—a rampant growth with hubs and spaces. The finger-like sections are marked A, B, C and D, representing four groups. B, C and D are very close to each other, while C and A are separated by a large space into which a thin, abrupt line protrudes—the dead end of a brief development.

In comments scattered around the sketch like balloons in a cartoon, Darwin explains what the lines, angles and bars represent: the origination, variation and extinction of the species. Branching and diverging lines signify adaptations of species over the history of generations; the abrupt end of a line signifies extinction. Lines ending in a bar indicate species that are still living.

If one were to count the running and crossed lines, there are 12 extinct species, and 13 living ones. Numerically, the 13 living species exceed the 12 extinct ones by exactly one. Assuming that resources remain constant, the newly emerging 13th species yields the competition that Darwin would later call the “struggle for existence.” The mechanism whose effect describes the convergence and termination of lines is called natural selection, after an essay by Thomas Malthus written the following year. However, even before Darwin read the British economist’s Essay on the Principle of Population and adopted his concept, he collected the elements of his theory of evolution in an image—in those irregular and branching ink marks from the summer of 1837.

Darwin was 28 years old when the small sepia sketches began to appear in his notebook; he had returned from sailing around the world aboard the H.M.S. Beagle around six months earlier. Like a stowaway, he brought back his theory of evolution, the result of a trip that took him to South America, the Galapagos Islands, Tahiti, New Zealand, Australia, Mauritius and Cape Town.

Just what he experienced and collected on, for instance, the Galapagos Islands became clear only after his return—a late awakening first brought to fruition in London. Surrounded by large collections, and through exchange with the top scientists of the day, Darwin made the discovery that became his purpose in life. It is this moment that is recorded on the page in the pocket-sized notebook housed in the archives of Darwin's Intelligent Design.
FOCUS

the famous pages of his notebook with the words "I think," which then continued as a drawing.

Cambridge University: the theory in the form of an image.

However, when Darwin wrote the words "I think" above the sketch, he had not known that he was creating what would become one of the most famous images of the 19th century – an icon of science history that is still reproduced in textbooks today. A contemporary of Darwin’s noted that the family trees in the works of his contemporaries sprang up “with the speed of the legendary beanstalk” as a result of On the Origin of Species. In 1859, Darwin appended his evolutionary theory to the book on a fold-out diagram – a creative solution that allowed the reader to consult the illustration while reading without having to leaf through the book. And despite the fact that several of Darwin’s illustrations became famous – just think of the Galapagos finches from the second edition of the voyage report – Darwin himself was convinced that he was a poor draftsman. This often led to disappointment on his journeys. “...from not being able to draw,” he later wrote in his autobiography. “...in not having sufficient anatomical knowledge, a great pile of my manuscript which I made during the voyage has proved almost useless.” During the last years of his life, painter and art theorist John Collier, who painted Darwin’s portrait in 1881, would teach him the fundamentals of drawing. Darwin politely thanked the artist, but once again expressed his regret over his inability of even being able to draw a straight line.

Uniformity of Idea and Drawing

His legacy, however, tells another story altogether: the images that intersperse his notes are like seismograms that chart the stations of his thoughts: the drafting, processing and rejection of theories. Darwin’s visual thinking was very expressive, despite a lack of talent. Merely drawing directly from nature is only one side of the art of drawing. Where Darwin was much more skilled, and even reached a kind of mastery, was not in representing the visible, but in making thoughts and considerations evident in his images.

A glimpse into the Darwin archive at Cambridge University is enough to notice that imagery must have been extremely important to his research activities. The portfolios, boxes, books and journals stored there contain an extensive and diverse image archive that proves that Darwin was a conscientious collector of visual matter. Today, the archive still houses a large amount of studio photography of men, women and children, medical and anthropological images, and engravings, woodcuts and lithographs of both exotic and indigenous animals. This is supplemented with drawings, some elaborately colored, that Darwin’s correspondents from all over the world sent to him, either enclosed with the letters or fit onto the page in small format amidst the writing. The fragile cargo of two butterfly wings affixed to a sheet of paper was a rare treat while studying in Edinburgh, but in making thoughts visually turn images of the Earth’s hidden interior into larger depictions or color maps – these were all abilities that he taught himself while abroad the Beagle, as evidenced by notebook entries and diagrams from those years. By practicing with the lapse of time and its visual depiction, which ordinarily eludes experiential rendering.

The actual problem – that the observational process exceeds the observation period or even the lifetime of the observer – had surfaced at the end of the 18th century in at least two fields, already setting image production there in motion. A few decades before Darwin, embryologists depicted the development of organisms from the first series of individual images; geologists showed the space and time of the interior of the Earth with cross-sectional diagrams. This translation of form and time into a symbolic system of rows, lines, angles and dots opened up the intellectual field for Darwin and his theory of evolution. This taught him to think in terms of millions of years and to anticipate the consequences of small changes in nature over long time periods, and to measure them by the slope of a line.

Building Blocks of a New Order

And so the history from which Dar- win’s own diagrams stem reaches back to England during the first half of the 19th century, to the city’s zoological societies and the ongoing debate about the categorization of animals and their place in the system of nature. Back then, London’s harbors consistently saw the arrival of new animal specimens from the colonies, mostly disassembled for reasons of conservation and transport. The masses of animal skins, fur, skeletons, preserved organs, dried hides, beetles, insects, snakes, mollusks and fish were quickly becoming problematic. The specimens that were amassed and tossed into museums during this period of colonial collecting Darwin sailed around the world when he was a young man, during which time he gathered the impulses that he would later use when developing his theories.
The branching of evolution is expressed in a diagram in *On the Origin of Species*, the first edition of which was completely bought out by book dealers on the first day of its publication.

Darwin's first destination (above) was the Cape Verde Islands, then on to the southern tip of South America, where the researchers continued Park or King's cartographic measurements in Patagonia and Tierra del Fuego. During his time ashore, Charles Darwin experienced a great deal — such as encounters with the indigenous people of Tierra del Fuego and fossil excavations in Patagonia — both of which inspired him and contributed to the development of his ideas about evolution.

Further steps during the trip included Chile, Peru, Chilean and, finally, the Galapagos Islands, where the finches would supply the inspiration for Darwin's theory of natural selection. The Beagle then sailed on to Tahiti, New Zealand, Tasmania, Mauritius, Cape Town, South America again, and finally, passing through the Azores back to England. After its return from this memorable voyage in 1836, the Beagle put out to sea for further surveying trips, mainly in the waters around Australia. Charles Darwin, however, was no longer on board.

The branching of evolution is expressed in a diagram in *On the Origin of Species*, the first edition of which was completely bought out by book dealers on the first day of its publication.