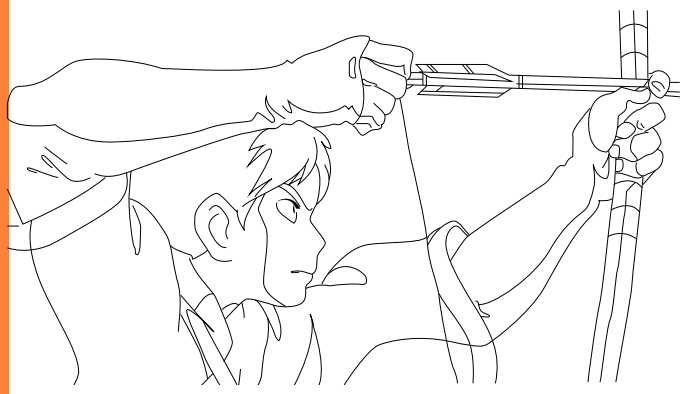
HAYAO MIYAZAKI

50 YEARS HAND-DRAWN ANIMATION

Edited by Deja-Nicole Stokes



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Design by Deja-Nicole Stokes

"But I turn back every time
to my pencil and paper."

—Hayao Miyazaki

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Introduction

With the international success of *Princess Mononoke* (*Mononoke Hime*, 1997) and *Spirited Away* (*Sen to Chihiro no Kamikakushi*, 2001), animation director Hayao Miyazaki established himself as a masterful creator of both enchanting fantasies and thought-provoking scenarios, often more tantalizing for adult spectators than for children. The appeal of Miyazaki's movies has accordingly been rapidly growing not only among *animé* experts and *otaku* but also, more importantly, among a worldwide general audience comprising diverse age groups and the broad domain of film criticism.

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Over the past two decades—and indeed for longer if one takes into account the director's output before the foundation of his own studio, Studio Ghibli—Miyazaki has brought to life intricate fantasy realms, building each from scratch and drawing their most minute items with total devotion. Within these domains, Eastern and Western traditions, ancient mythologies and contemporary cultures, the magical visions of children and the pragmatic outlooks of adults intriguingly coalesce. At the same time, in using traditional cel animation and cutting-edge digital techniques—employing computers to manipulate images and to accomplish visual and special effects unattainable by traditional means, yet remaining faithful to the two-dimensionality of the art of drawing—the director and his studio have crucially redefined the standards of contemporary animation.

Miyazaki's wondrous worlds are as challenging as they are spellbinding due to their simultaneous evocation of an elating sense of freedom and of a harrowing vision of life's darker facets. This conceptual mix is created by positing the encounter with a magical Other as a metaphor not merely for a flight of fancy but also, more importantly, for the imperative to confront maturely and responsibly the full import

> “I gave up on making a happy ending in the true sense a long time ago. I can go no further than the ending in which the lead character gets over one issue for the time being. Many things will happen after this…I think that’s as far as I can go. From the standpoint of a movie maker, it would be easier if I could make a movie in which ‘everybody became happy because they defeated the evil villain’ ”
>
> —Miyazaki, 1988.

of such an encounter, regardless of the difficulties, afflictions and humiliations involved in the process. No imaginary domain ultimately promises unconditional escape from moral and social obligations, and from the power of language to affirm or deny both personal and collective identities. Above all, learning how to respect and honor other people and one’s environment at large is the prerequisite for the acquisition of a sense of self.

His endings steer clear of consolatory, tidying-up messages, offering instead purely provisional closures which audiences can scarcely anticipate or presuppose. The plots themselves tend to follow life’s own unpredictable flux more than the narrative or dramatic criteria codified by mainstream spectacle.

CHAPTER 1
HAYAO MIYAZAKI

A journalist once dubbed Hayao Miyazaki "The Japanese Disney," and the epithet has stuck. While it was intended as a compliment, and while it must certainly have drawn additional Western viewers to the movies of this exceptional animator; it nevertheless does him a very great disservice. Miyazaki's movies are considerably richer than Disney's, in terms of storytelling, subtext, palette, and emotional depth. He is also much more of a hands-on animation director: to cite a single example, of the almost 150,000 cels in *Princess Mononoke* (1997), Miyazaki personally altered or touched up no fewer than 80,000.

Opposite: Hayao Miyazaki

His love for his chosen artform shines through almost every frame that hits the screen; although he has become a commercially successful director; there is never the remotest sense while watching a Miyazaki movie that he is driven by anything other than the joy of creation.

Hayao Miyazaki was born in the Bunkyo-ho district of Tokyo on January 5, 1941. His father, Katsuji Miyazaki, was employed as an executive at the factory, owned by Hayao's uncle, Miyazaki Airplane, that constructed parts for the Japanese fighter planes deployed in World War II. This familial background is most likely to be the source of the director's passion for aviation and flying machines of all sorts. Hayao's mother was no less profound an influence, as evinced by the fact that it is largely upon her personality that Miyazaki has based the courageous, energetic and autonomous female characters so typical of his films.

EARLY WORK

The young Miyazaki was, from a very early age, extremely interested in drawing. This interest was fed by his reading of manga, and played out by drawing manga illustrations. As he entered high school, his desire to become a manga author was growing but when he saw *Legend of the White Serpent*, in the final year of high school, he was so inspired that he decided to become an animator and gave up on the idea of being a manga artist. In his early twenties, after gaining a degree in political science and economics, he obtained a job that was related to his favorite artform: as an "in-betweener" for Toei-Cine. He soon found himself "in-betweening" for such projects as the feature movie

Above: Hayao Miyazaki

Opposite: Osamu Tezuka

Miyazaki was one of many postwar Japanese youths who fancied a career as a comic-book artists, and Osamu Tezuka (1928-1989) was, unequivocally, the most powerful role model available.

Watchdog WoofWoof (*Wan Wan Chushingura*; 1963), the TV series *Wolf Boy Ken* (*Okami Shonen Ken*; 1963–65) and the theatrical Short *Gulliver's Space Travels* (*Gulliver no Uchu Ryoko*; 1965). Miyazaki was allowed to work on some key animation for the next tv series *Wind Ninja Boy Fujimaru* (*Shonen Ninja Kaze o Fujimaru*; 1964–65) and graduated to just working on animation with the TV series *Hustle Punch* (*Hussuri Panchi*; 1965–66).

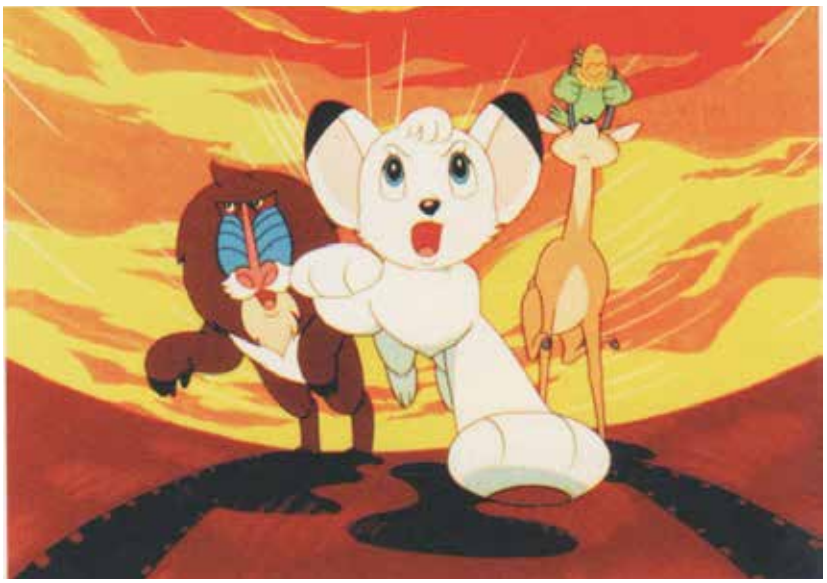
INSPIRATION

Miyazaki was one of many postwar Japanese youths who fancied a career as a comic-book artists, and Osamu Tezuka (1928-1989) was, unequivocally, the most powerful role model available.

Tezuka's first success was the publication, in his native Osaka, of *Shintakarajima* (*New Treasure Island*), a comic book that already exhibits the graphic quality and dynamism of subsequent animations. Tezuka's most popular characters were *Tetsuwan Atom* (*Astro Boy*), *Ribon Ni Kishi* (*Princess Knight*), and *Jungle Emperor Leo* (*Kimba the White Lion*: most likely the inspiration behind the character design in Disney's *The Lion King*). Throughout his life Tezuka produced a total of about 17,000 pages of manga, 700 stories, 12 TV specials and 21 TV series. The manga master's reputation was so great and ubiquitous that it rapidly became the cause of a

serious case of "anxiety of influence" for the young Miyazaki. It was not until he was appointed as an animator by Toei Animation Studios that Miyazaki began to free himself of the illustrious predecessor's hold on his imagination.

Miyazaki's early inspirations to animation was by Japan's first color animated feature, *Legend of the White Serpent* (*Hakujaden*, 1958) directed by Taiji Yabushita and the American Artist Windsor McCay's comic strips *Little Nemo in Slumblerand* and *Dreams of the Rarebit Fiend* and creator of the 1913 cartoon *Gertie the Dinosaur.* He was also influenced by Max Fleischer, the American animator who created *Betty Boop* (1930) and his style that foregrounded the drawn character of the medium. The French animation *The*



Influential Artists and Authors

Taiji Yabushita director of *Legend of the White Serpent* (*Hakujaden*, 1958)

Windsor McCay, American Artist, creator of comics *Little Nemo in Slumblerand* and *Dreams of the Rarebit Fiend* and the 1913 cartoon *Gertie the Dinosaur.*

Max Fleischer, American animator, creator of *Betty Boop* (1930)

Paul Grimault, French director for *The Shepherdess and the Chimneysweeper* (*La Bergère et le Ramoneur*, 1952)

Lev Atamanov, Russian director of *Snow Queen* (*Snezhnaya Koroleva*, 1957)

Frederic Back, the Canadian animator and illustrator

Yuri Norstein, Russian animator and author of *Tale of Tales* (1979); Jonathan Swift, author

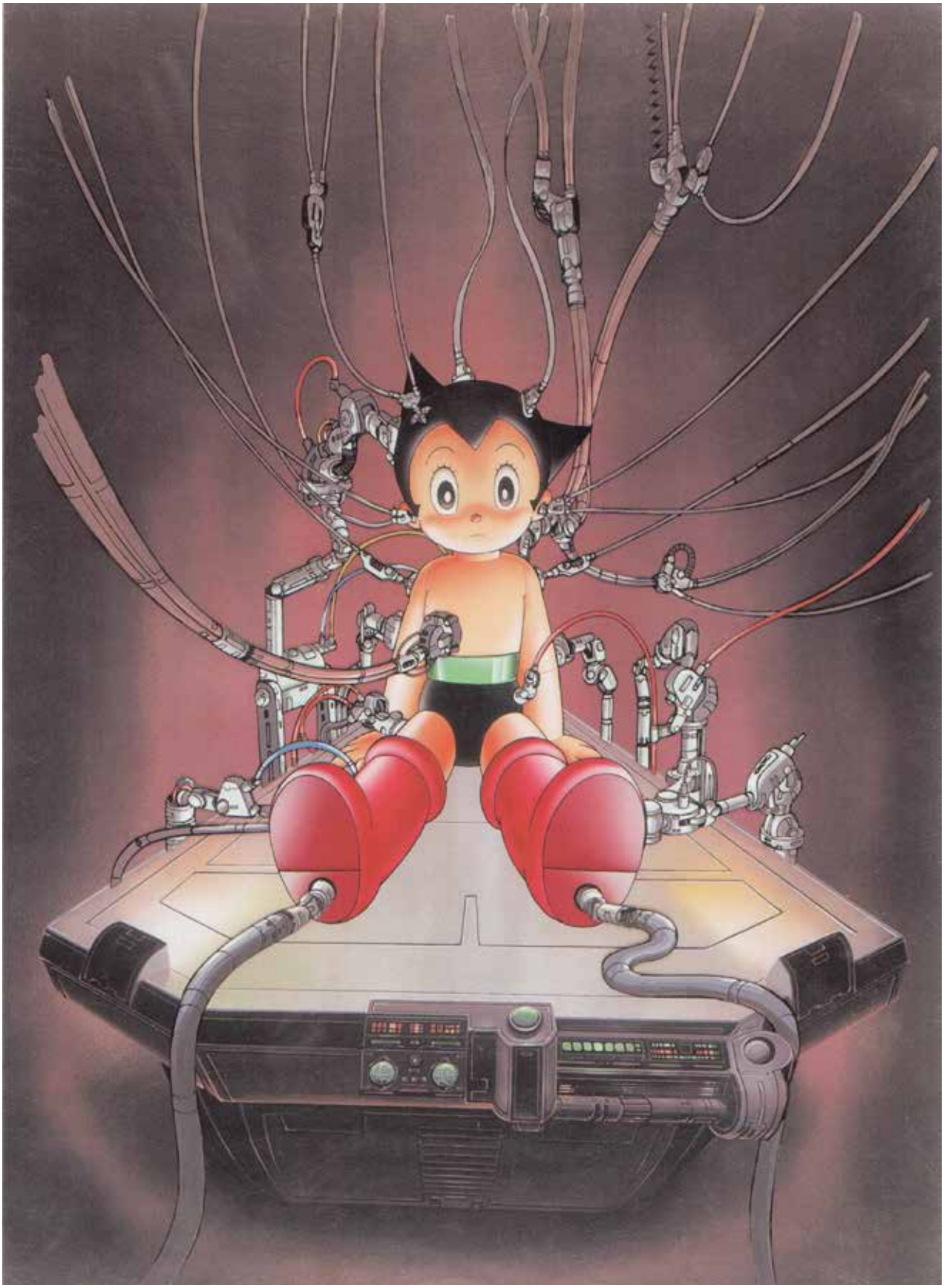
Maurice Leblanc, author

Eiko Kadono, author

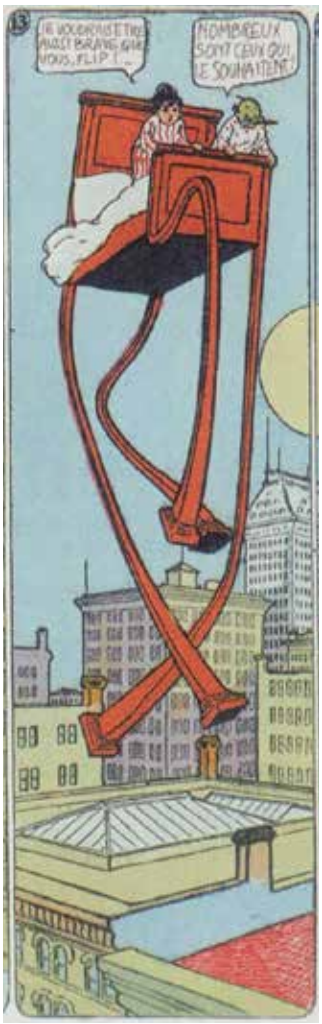
Diana Wynne Jones, author

Left: scene from *Jungle Emperor Leo* (*Kimba the White Lion*)

Opposite: *Tetsuwan Atom* (*Astro Boy*)



Shepherdess and the Chimneysweeper (*La Bergère et le Ramoneur*, 1952) directed by Paul Grimault, a production that showed Miyazaki how an animated film could be legitimately targeted at an adult audience, while also affecting *Cagliostro's* architectural look. The Russian animated feature *Snow Queen* (*Snezhnaya Koroleva*, 1957) directed by Lev Atamanov, a film that strengthened the director's determination to commit myself to an animation at a time of self-doubt, and inspired the characterization of the King and Hilda in *Hols*. Frederic Back, the Canadian animator and illustrator (among many other works) of Jean Giono's The *Man Who Planted Trees* (1954), from whom Miyazaki derived the flair for drawing and animating plants. The Russian animator Yuri Norstein, author of *Tale of Tales* (1979); and several writers from Jonathan Swift (1667–1745) through Maurice Leblanc (1864–1941) to contemporary authors such as Eiko Kadono and Diana Wynne Jones. While objecting to the narrative approach adopted by Disney productions, with their neat endings and stark good/evil dichotomies, Miyazaki has nonetheless frequently admitted to liking early Disney shorts such as *Silly Symphonies* (1934).



Education and Early Career

In 1963, upon leaving the prestigious Gakushuin University (where he had read politics and economies but concurrently derived great pleasure and invaluable sources of inspiration from his involvement in the Children's Literature Research Society), Miyazaki joined Toei Animation Studios. In this context, the young animator played a very active role as a trade union organizer and met Isao Takahata, the man with whom he would share his future career to this day. In 1965, Takahata started working on *The Adventures of the Hols, Prince of the Sun*, a.k.a. *Little Norse Prince Valiant* (*Taiyou no Ouji—Horusu no Daibouken*) in a directorial role; and Miyazaki

was given the opportunity to contribute to the project as scene designer and key animator. The film was completed three years later, at once supplying evidence for its maker's skills and for their employers' lack of adventurousness.

Toei ultimately proved far too restrictive a context for both Miyazaki and his nakama (partner) Takahata for the simple reason that the company's rules and objectives were invariably accorded total priority. As Miyazaki himself has explained, "The company told us various things, such as 'kids would love to see small animals,' or 'well, you say so, but unless you do a well-known classic story, tickets won't sell.'"

In 1971, after working on *Ali Baba* (a subversive verison of the tale from *Arabian Nights* that turns the now wealthy Ali into a villain), Miyazaki moved to A-Pro Studios with Takahata. Two years later, both started working at Nippon Animation, where Miyazaki took a substantial role in the production of the animated televisions series *World Masterpiece Theatre* for a period of five years. This was underpinned by extensive travel around Europe in order to obtain firsthand impressions of the landscapes in which the stories comprised in the series—namely, classics of Western literature—would be set. In 1978, he directed *Conan, Boy of the Future*, his first TV series, and in 1979 he moved again—this time to Toho Studios, where he would direct his first feature film, *Lupin III: The Castle of Cagliostro*.

From 1969 onwards, Miyazaki also engaged in the production of various *manga*, including a number of series which either provide the foundations for, or run in parallel to, filmic productions.

Above: scene from *Prince of the Sun* or *Little Norse Prince Valiant* (*Taiyou no Ouji—Horusu no Daibouken*)

Opposite: Windsor McCay's *Little Nemo in Slumblerand* comic strip

Map of the greater Tokyo area, Japan

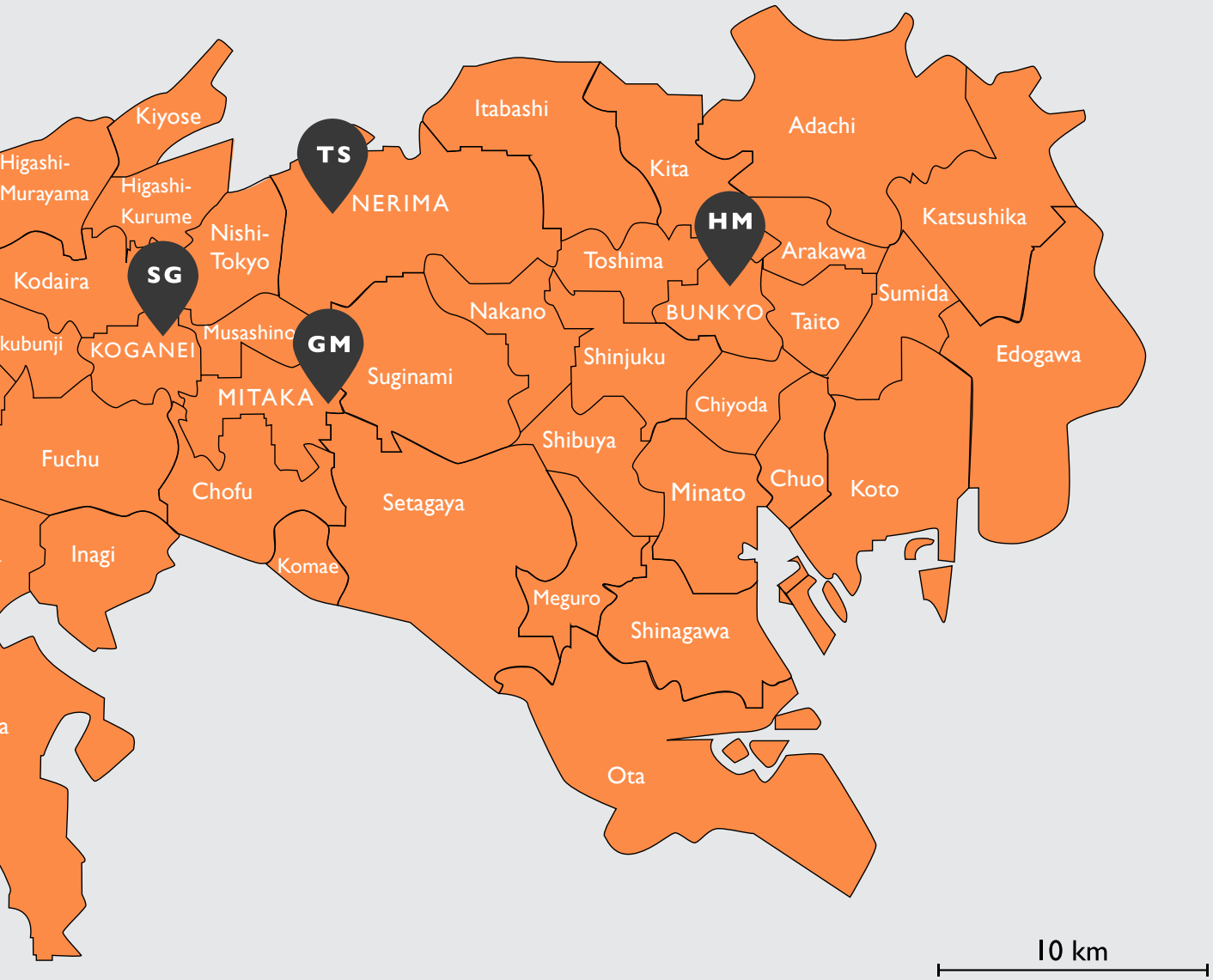
This map highlights the major locations for Hayao Miyazaki's life and achievements:

GM stands for Studio Ghibli Museum which is located in Shimorenjaku, Mitaka, Tokyo.

HM is short for Hayao Miyazaki, who was born in the Bunkyo district of Tokyo.

SG stands for the Studio Ghibli studio which resides in the Koganei district of Tokyo.

TS is short for the Toei-Cine headquarters located in Higashi Ohizumi, Nerima, Tokyo. Toei was Miyazaki's first major animation employer.


Kiyose
Higashi-
Murayama
Higashi-
Kurume
Nishi-
Tokyo
Kodaira
SG
kubunji
KOGANEI
Musashino
GM
MITAKA
Suginami
Fuchu
Chofu
Inagi
Komae
Setagaya
TS
NERIMA
Itabashi
Kita
HM
Toshima
Nakano
BUNKYO
Shinjuku
Shibuya
Meguro
Shinagawa
Ota
Minato
Chiyoda
Chuo
Koto
Arakawa
Taito
Sumida
Adachi
Katsushika
Edogawa
10 km

スタジオジブリ作品

STUDIO GHIBLI

CHAPTER 2

STUDIO GHIBLI

Studio Ghibli was founded in 1985 to produce *Laputa: Castle in the Sky*. However, the studio's inception can be tracked to 1983, when Tokuma Shoten (the publishing company responsible for the production of *Animage*, the magazine in which Miyazaki had been serializing the manga *Nausicaä* since 1982) decided to produce *Nausicaä of the Valley of the Wind* as a feature-length film. The film's huge success prompted Tokuma and Miyazaki to establish Studio Ghibli to make their next movie.

The term "Ghibli" refers to both a hot Sahara wind and the model of the Italian scouting aeroplane used during World War II.

Opposite: Studio Ghibli logo, which also features Totoro from *My Neighbor Totoro* (1986).

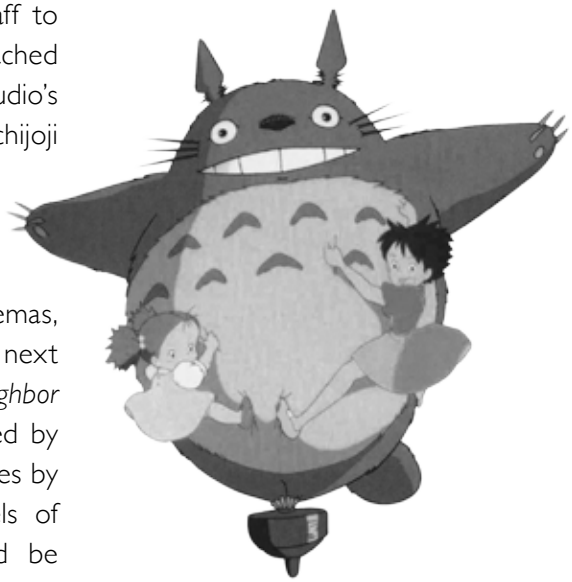
"Make one film. If that succeeds, make another. If that flops, that ends it."

—Toshio Suzuki

It is perhaps unsurprising, given Miyazaki's love of planes and Italy alike, that he should have picked this particular rubric for his studio. In Japan, the studio's name is pronounced *jiburi* and in the West, *geeblee*.

Studio Ghibli is quite unique in its intention, at least in principle, to produce feature films based on original work. This policy involves considerable financial risks since box-office success can never be automatically guaranteed. Although, as Studio Ghibli producer Toshio Suzuki stated in a speech delivered at Annecy International Animated Film Festival, in the summer of 1995, "The idea was to dedicate full energy into each piece of work with sufficient budget and time, never compromising on the quality or content…To be honest, none of us thought that Studio Ghibli would survive for this long a time. 'Make one film. If that succeeds, make another. If that flops, that ends it.'"

To minimize potential losses, Ghibli did not hire any full-time employees but rather relied on about seventy temporary staff to complete one film at a time. Once the production had reached exhibition stage, the team would be dismissed. At the time, the studio's location consisted merely of one rented floor in a building in Kichijoji in a suburb of Tokyo.



Films and Success

Nausicaä released in 1984, drew around 915,000 people to cinemas, and *Laputa*, released in 1986, attracted around 775,000. The next two films made by Ghibli—to be released in 1988—were *My Neighbor Totoro* (directed by Miyazaki) and *Grave of the Fireflies* (directed by Takahata). The simultaneous release of two feature-length movies by two highly talented directors gave rise to tremendous levels of pressure and stress, as the quality of neither work could be

Kiki's Delivery Service, released in 1989, drew approximately 2.64 million, making it the indisputable number-one hit among all Japanese movies (not just animations) released in that year.

sacrificed. The idea seemed almost suicidal, yet it was too tantalizing a challenge for Ghibli to miss. The then president of both Studio Ghibli and Tokuma Shoten, Yasuyoshi Tokuma, played a vital role in the promotion of this double-feature venture, despite his customary inclination not to interfere with the studio's activities. As Suzuki has noted, "Tokuma himself went to the distributors, campaigned for the two films, and successfully made an agreement with the distributors to make the release of the two films possible."

The first Ghibli film to achieve Disney-like mega-success was *Kiki's Delivery Service*, released in 1989. Approximately 2.64 million people saw the film, making it the indisputable number-one hit among all Japanese movies (not just animations) released in that year.

Ghibli and CGI

In 1993, Ghibli started its exploration of the relatively novel territory of CGI by purchasing two large computerized cameras. The 1994 film directed by Takahata, *Pom Poko* (another number-one hit in Japan), signaled Ghibli's first use of CGI—used only in three cuts. It was with the production of *Princess Mononoke* (1997) that the studio began to specialize in the art of CGI. Their first 100 percent digital feature was Takahata's *My Neighbors the Yamadas* (1999), a production containing 150,000 computer-generated equivalents of traditional cels. An Avid Media Composer 8,000 system was introduced at Studio Ghibli in 1998 and, since then, all of its projects have been edited digitally. *Spirited Away* was the first fully digital animated film directed by Miyazaki. The project made use of numerous computer graphics and animation tools, including those patented by Softimage Co., a subsidiary of Avid.

Opposite: Totoro, Satsuki, and Mei; *My Neighbor Totoro*

The "agreement [with Disney would] give much greater exposure to the works of Miyazaki."

—Andrew Pollack

Ghibli and Disney

In 1996, the Walt Disney Corporation and Tokuma Publishing arrived at an agreement—known as the Disney/Tokuma Deal—whereby Disney was granted the worldwide (including Japan, but excluding the rest of Asia) home-video distribution rights to several Studio Ghibli films. Thus far, these have included Miyazaki's *Nausicaä of the Valley of the Wind*, *Laputa: Castle in the Sky*, *My Neighbor Totoro*, *Kiki's Delivery Service*, *Porco Rosso*, *Princess Mononoke*, *Spirited Away* and *Howl's Moving Castle*, as well as Takahata's *Only Yesterday*, *Pom Poko* and *My Neighbors the Yamadas*, Yoshifumi Kondou's *Whisper of the Heart* and Hiroyuki Morita's *The Cat Returns*. The contract stipulates that "Disney cannot cut even one second from the films." According to Suzuki, "other companies such as Fox and Time-Warner contacted Tokuma, but Disney was the only company willing to agree to this condition, and that was the main reason why Tokuma chose Disney as a partner."

When some critics wondered whether the deal meant that, despite his misgivings about Disney productions, Miyazaki might actually have sold his soul to Disney, the Japanese director stated that "he didn't like the movies by Toho or Toei either (they are the Japanese movie companies which have been distributing the Ghibli films). He distinguishes between film production and film distribution. He also stated that he had agreed to the deal mainly to help Tokuma, which had backed him when he was started out. He said he has earned enough money to last him a lifetime" Furthermore, as Andrew Pollack stressed at the time of its establishment, the "agreement [with Disney would] give much greater exposure to the works of Miyazaki" who was still "little known outside his home country" at the time.

Opposite Top Left:
Preperatory Meeting for film.

Opposite Top Right:
Clarifying Drawings.

Opposite Middle Left:
Checking Drawings.

Opposite Middle Right:
Hand Trace.

Opposite Bottom Left:
Applying Color.

Opposite Bottom Right:
Final Check.

Character Differentiation

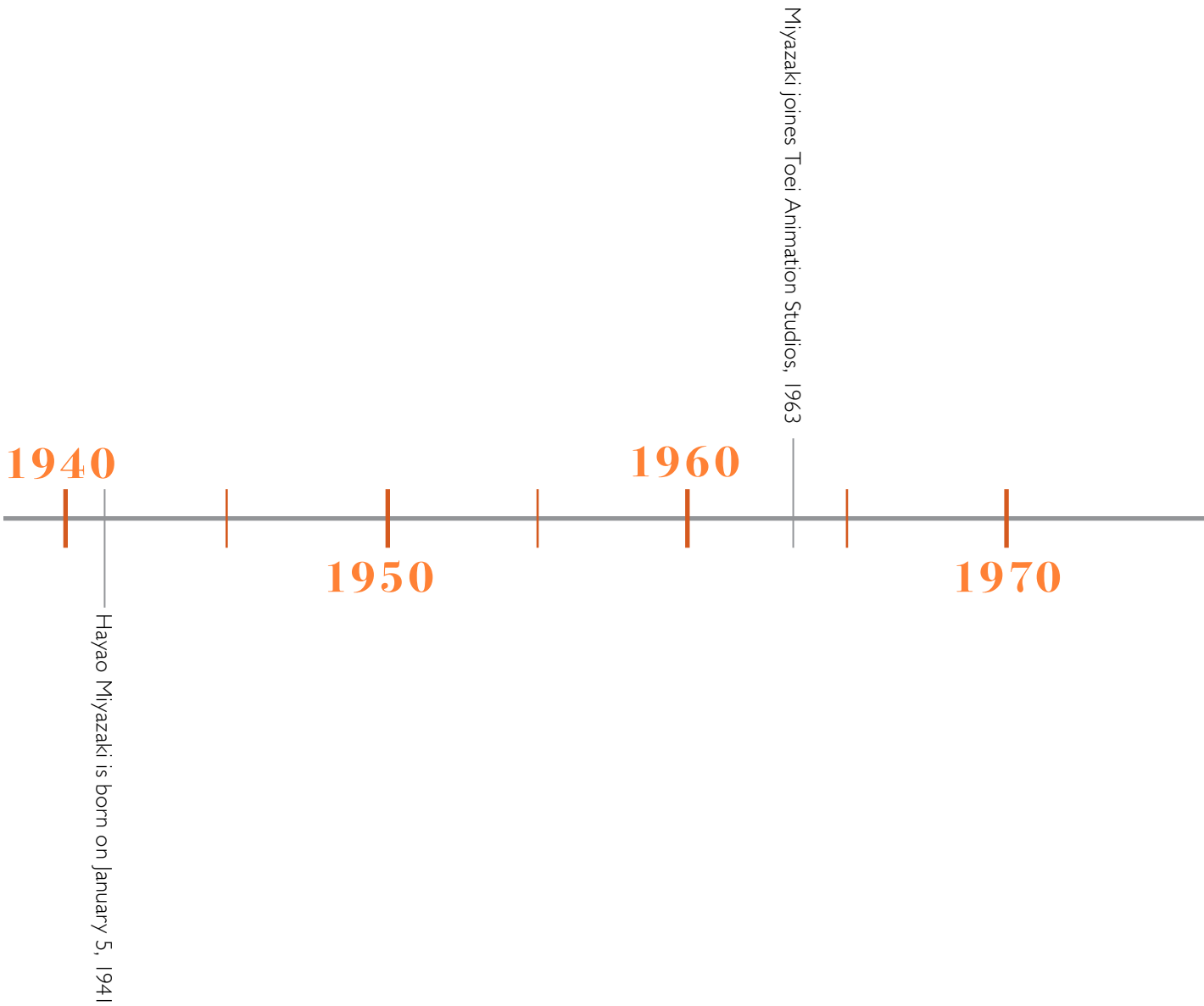
Character's *Difference*: the distinctive traits that make that character an individualized being with a recognizable personality.

The stratagems that enable animators to endow their creations with vitality are often quite simple, but their deft handling can engender staggering results. For example, leaning or twisting a character's body, flopping its knees in and out, tilting its belt line or breaking its joints at the appropriate point and in unexpected ways can achieve more than any amount of state-of-the-art special effects (SFX) can. At the same time, it is crucial to reflect at all stages of the animation process on the specific details—however minute and apparently insignificant these may seem—which establish a character's *difference*: the distinctive traits that make that character an individualized being with a recognizable personality.

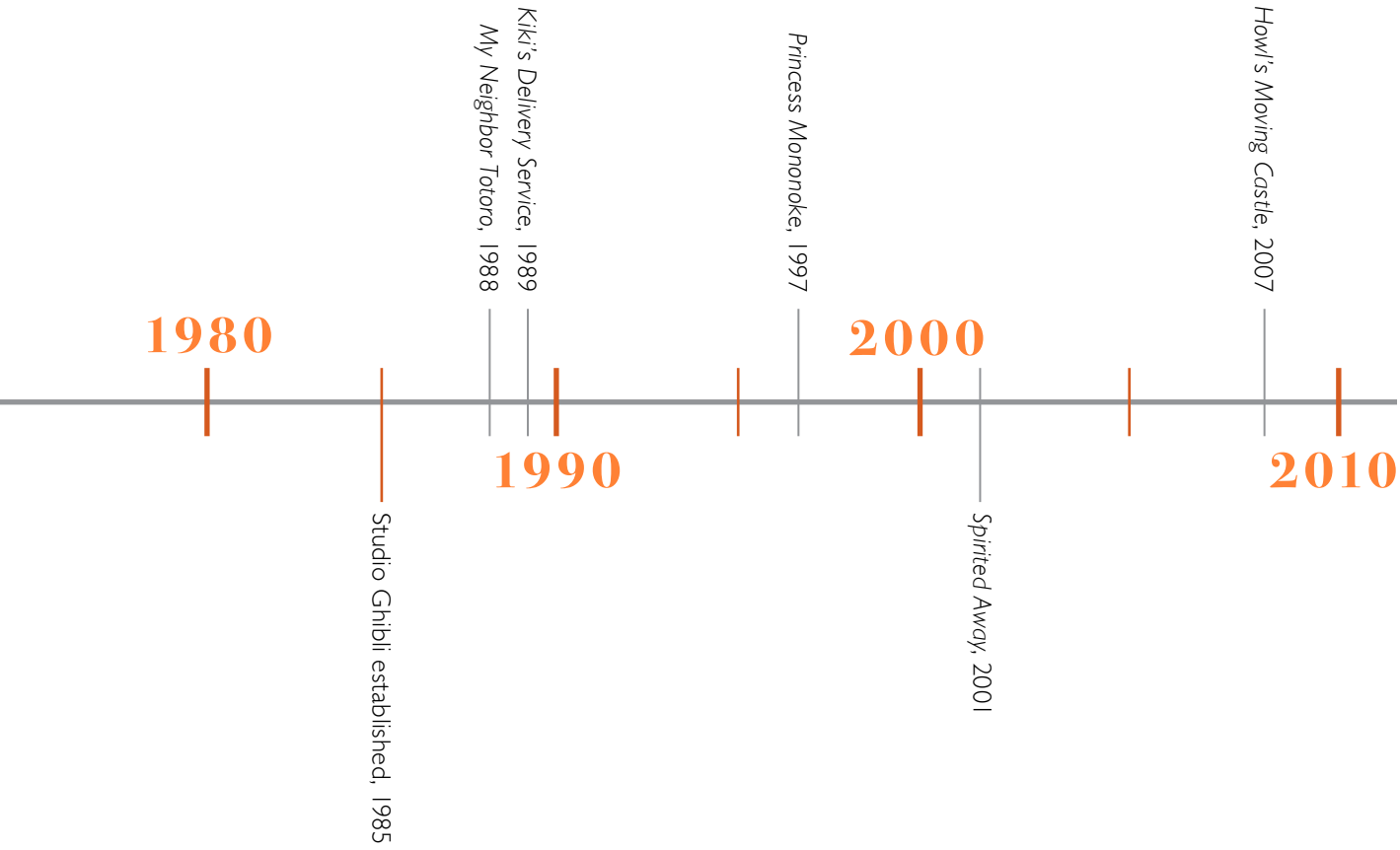
This is a particularly important in the realm of *animé*, where characters are often designed according to formulae which would seem to leave little leeway for originality. It is indeed one of the most remarkable aspects of Hayao Miyazaki's art that his characters are thoroughly individuated and distinct even where striking physical resemblances may threaten to make them indistinguishable. For example, Nausicaä (*Nausicaä of the Valley of the Wind*) and Fio (*Porco Rosso*) exhibit somatic similarities, but it is preposterous to assume that even the least sympathetic spectator would mistake one for the other. Also worthy of notice, in this respect, is Miyazaki's ability to differentiate his elderly characters both studiously and affectionately despite their superficial affinities. Thus, one would not dream of confusing Bertha (*Kiki's Delivery Service*) and Old Sophie (*Howl's Moving Castle*), or Uncle Pom (*Laputa: Castle in the Sky*) and Clocktower Caretaker (*Kiki*).

Opposite Top: sketches of Chihiro, *Spirited Away.*

Opposite Bottom: sketches of Markl, *Howl's Moving Castle.*


1940
1950
1960
1970
Hayao Miyazaki is born on January 5, 1941
Miyazaki joines Toei Animation Studios, 1963

STUDIO GHIBLI TIMELINE

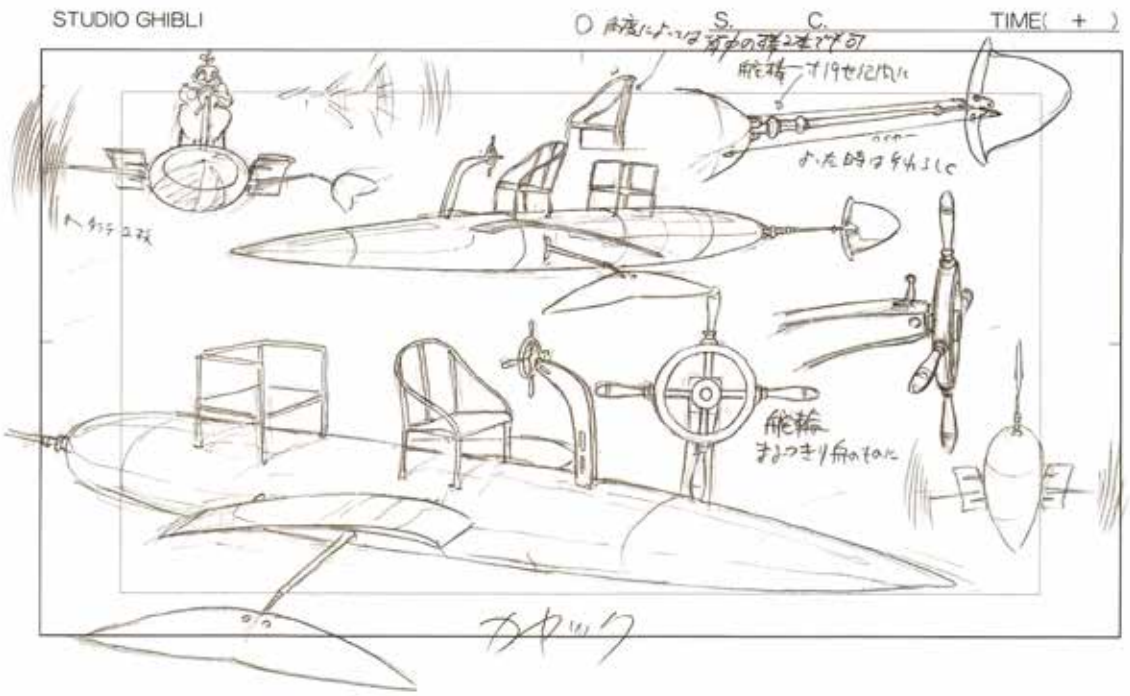


CHAPTER 3: TRADITIONAL

CHAPTER 4: DIGITAL

CHAPTER 5: 3D

ANIMATION TECHNIQUES


STUDIO GHIBLI
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CHAPTER 3

TRADITIONAL ANIMATION

In traditional cel animation, before the actual animation process begins, a soundtrack is recorded to which the action may be precisely synchronized. Because of the diligently paced and methodical fashion in which traditional animation is created, it is more practical to synchronize the movements to prerecorded sounds than sounds to pre-established movements. The dialogue is recorded on tape and then transferred onto a magnetic filmstrip which is analyzed in a sound reader, whereby every single syllable can be registered on an exposure sheet divided into many rows, each of which corresponds to one frame of film.

Left Above: Flying Kayaks concept sketches for *Howl's Moving Castle.*

Left Bottom: Bomber concept painting for *Howl's Moving Caslte.*

Music and special sound effects are not normally recorded until after the movie has gone through the final cut. If the budget allows, an animatic is made once the soundtrack has been prepared. This consists of pictures extrapolated from storyboards synchronized to the soundtrack and allows the animators and directors to figure out the timing of a sequence; it is vitally important for each frame to match accurately whatever happens to be going on in the soundtrack at the moment that frame appears. It is at the next stage that the animation proper begins.

In traditional animation, artists begin by drawing sequences of images one picture—or frame—at a time. The key animator draws the keyframes (or extremes) that designate especially significant points in a sequence, and the assistant animators then produce the frames situated between any two keyframes. The outcome of this process, known as tweening, is a fluid sequence of images. In-betweens are extremely important since, unless the in-between animators adhere to the stylistic features established by the extremes, the result will be a wobbly picture—as notoriously demonstrated by the use of frames where a character's eyes are alternately circular and oval.

Once a sequence has been drawn, all the pictures—except background images—are transferred from paper to transparent sheets of plastic, namely cels (so-called because they used to be made of celluloid although they are now made of acetate). The outlines of the images are first inked onto the cels and colors subsequently added to them. When a complete sequence of images has been transferred to cels, production enters the photography stage. All the cels involved

Above: Dave Fleischer, co-creator of Fleischer Studios and the Rotoscope process.

Opposite: Fleischer artist inking character for animation, *Popeye*.

The outcome of this process, known as tweening, is a fluid sequence of images. In-betweens are extremely important since, unless the in-between animators adhere to the stylistic features established by the extremes, the result will be a wobbly picture

in each frame of the sequence are stacked in layers, with the background images at the bottom of the pile, and the composite image is photographed. The cels are then removed and the process is reenacted for the next frame until each single frame in the sequence has been photographed. Registration holes (small holes along the top or bottom edge of the cel) allow the cel to be placed on pegs before the camera and be precisely aligned with the one before it, so as to avoid jittery transitions.

Above: storyboards of Howl fighting in the war, *Howl's Moving Castle.*

Cel Animation and Computer Graphics Images:

"Cartoons," broadly understood as pictorial representations with a more or less overt narrative thrust, are arguably as old as humanity, the earliest documents consisting of cave paintings produced about 20,000 years ago. The first actual marriage of drawing and photography took place in 1896, when the cartoonist James Stuart Blackton drew a sequence of images and Thomas Edison photographed them as a progressive series.

The paragraphs that follow outline the main stages of both the traditional and the digital animation processes. Miyazaki, over the arc of his career as an animator and director, has played varyingly important roles in, and experimented with, several aspects of animation. Although it should be first noted that all forms of animation comprise a set of basic phases:

Concept—this is the pivotal controlling idea on the basis of which stylistic and technical decisions about the execution of an animated movie are made.

Design—this refers to the visualization of the preliminary concept through the drawing of storyboards, namely sequences of pictures (analogous to comic books) that show how the story will be articulated in terms of a specific graphic-pictorial language, how the action will develop, what camera angles may be most appropriate to its capture, and where characters fit in all of this.

Model Sheets—these outline the attributes of individual characters in accordance with the movie's overall style—which, in turn, may amalgamate images derived from other animated features with disparate elements of popular culture and allusions to the work of famous painters and illustrators.

Character Development

The production of an animated feature is never definitively completed until the exhibition stage, as the initial concept remains always open to scrutiny and revision. Furthermore, as Ed Hooks has argued, "a good animator must go through the…process of motivating his characters on a moment-to-moment basis, but [he or] she must keep recreating the same moment over and over again, sometimes for weeks on end, while she captures it on the page or computer screen. Actors learn that once a moment has gone, it's gone for good, but animators have to pitch camp at the intersections of movement and emotion." There is a sense in which animators themselves become akin to actors, in that—by articulating their characters in terms of the relationship between physical actions and affective reactions—they have to develop, and even identify with particular types of performance.

At the same time, characters too are comparable to actors. Indeed, animators must conceive of their creatures as performers, imagining not merely their superficial appearance but also their hypothetical backdrop—namely, elements such as, provenance, ethics, tastes. A number of factors pertaining to different types of movement and to resulting attitudes must be taken into consideration while building a character along these lines. As Williams maintains throughout his seminal *Animator's Survival Kit,* the principal elements of cartoon characterization include:

Walks
Runs, Skips and Jumps
Flexibility
Weight
Anticipation
Takes and Accents
Timing
Dialogue

CHAPTER 4

DIGITAL ANIMATION

Digital Animation can be broadly described as the art of creating moving images via computers using both 2D and 3D graphics. Depending on the complexity of the image, animators will either draw it directly on the computer or manipulate digitally digital scannings of physical models. Digital animation comprises of two main approaches to the medium. In one case, the two-dimensional look characteristic of the art of drawing (upon which animation is essentially based) is retained. Computers are used to manipulate images and to achieve visual and special effects that could not be achieved by traditional means, without effacing the two-dimensionality of the materials in hand.

Opposite: CG Process shots for *Princess Mononoke* using the morphing process.

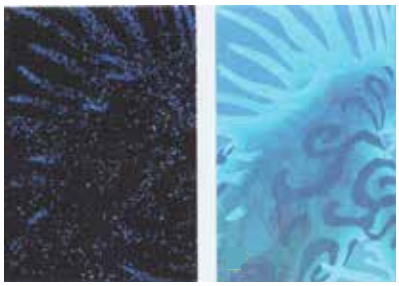
In the other case, digital technology is implemented in order to endow two-dimensional images with three-dimensionality by translating 2D drawings into 3D computer objects.

Although at times Studio Ghibli uses 3D digital objects such as wiremesh frames, it essentially follows the former modality, being devoted to the preservation of an overall look that fosters the drawn and the painterly over the sculptural. The principal digital techniques used at Ghibli include:

Compositing: a process whereby separate elements (i.e. photographic images) are filmed, scanned into a computer and combined onto a piece of film.

Above and Opposite: various CG Process shots for *Princess Mononoke*

Particle systems: a procedural animation technique designed to manipulate clusters of objects. For example, a bunch of points can be instructed to move like a cloud, a waft of smoke, or a gush of steam.

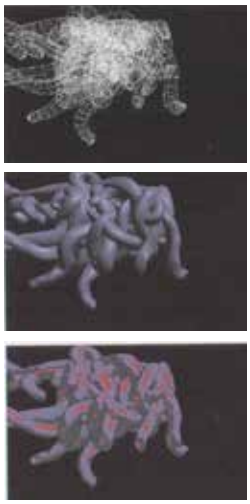


Morphing: a special effect used to produce a smooth transformation from one object or shape to another. An image is scanned into the computer and digitally manipulated, sometimes by being combined with wholly virtual images, and then integrated into a piece of animated footage.

Ray tracing: a technique that can give the impression of computer-generated objects being touched by light beams in the same way as corporeal entities would in the real world.

Above and Opposite: various CG Process shots for *Princess Mononoke*

Rendering: a technique that outputs each single pixel until all the computer-generated images in film are assembled. The virtual scene, immersed in virtual light, is recorded by a virtual camera. Rendering requires massive processing resources.



Texture-mapping: the process of superimposing a 2D texture or pattern (simulating the appearance of numerous substances) over the surface of a 3D graphic object.

Compositing

In the scene of Ashitaka shooting an arrow while riding Yakkuru, the snakelike tendrils curling around his right arm were made with three-dimensional computer graphics. Data concerning various elements, including vertical and horizontal paths, shadows, and movement are input into the computer.

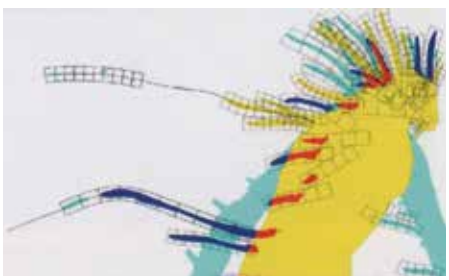
Mapping

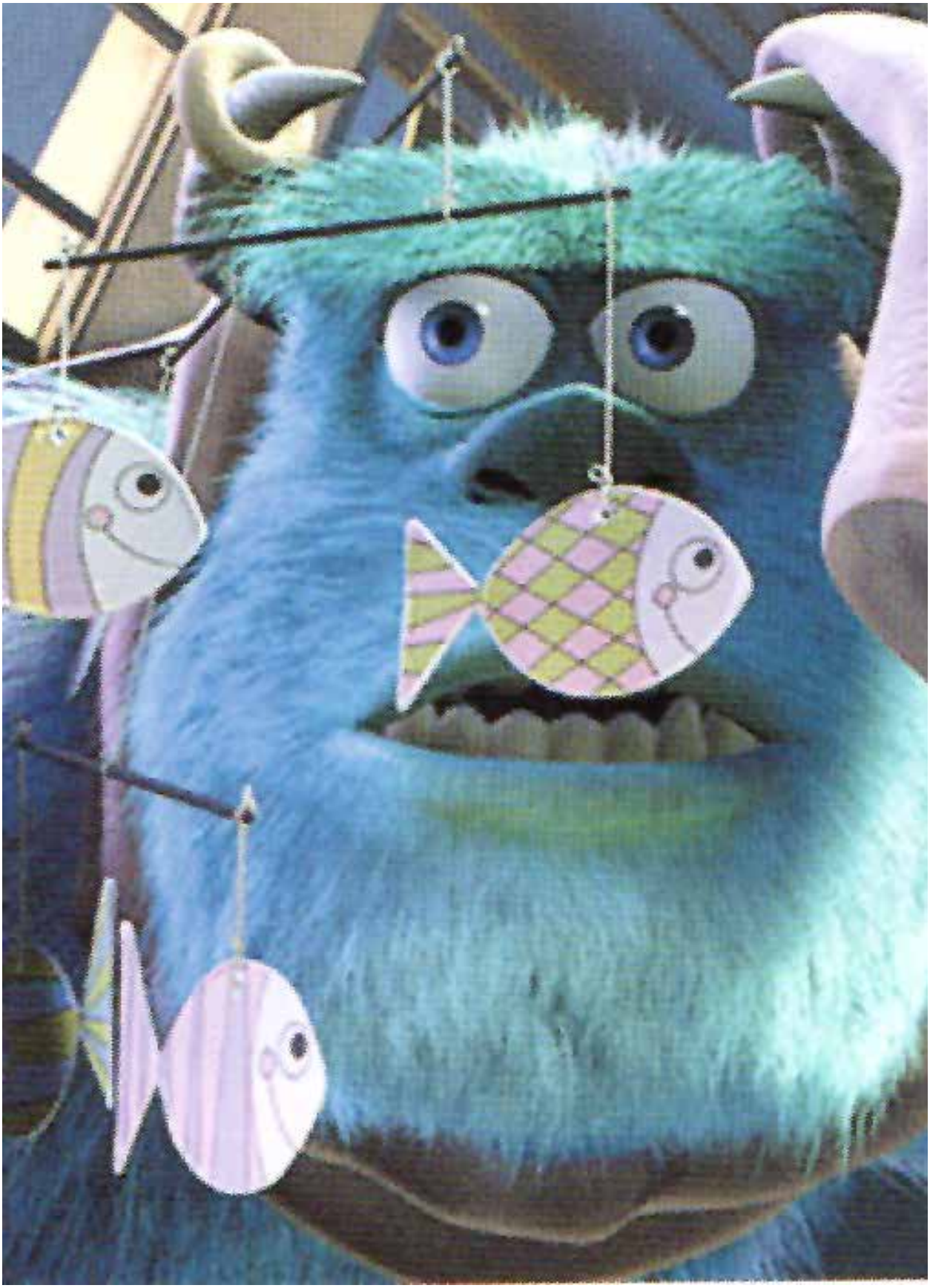
The images on the previous page show an example of mapping from cut 1102 in the film. The image on the previous page is a three-dimensional model of the topography used in the scene, made by calculating surface undulations, as well as the speed and the distance at which the camera will move. Picturing is a background drawing of a slope that will move into the foreground during the scene. Next to that is a background drawing that shows a mountain ridge in the distance. The image in the bottom right of the section is the finished image in which the drawing of the foreground has been composited on the drawing of the background. The drawing of the foreground has in turn been attached to the 3D topographical drawing. When the finished image is animated on the computer screen, the scenery in the distance gradually comes into view as the camera moves forward. On the computer, this effect can be achieved smoothly and seamlessly.

Opposite: Night Stalker from *Princess Mononoke*, showing the particle-system.

Particle-systems

Pictured on page 31 are light particles generated by the Particle tool set. Various data, including the force of gravity, the movement of the wind, and the direction of air eddies are input into the computer and the particles are animated to look like bubbles rising up. Below, the particles are composited to the finlike protrusion from the back of the Night Stalker. The image to the left is the original, while the center image shows the flow of the light particles, and the image to the right is the finished drawing.

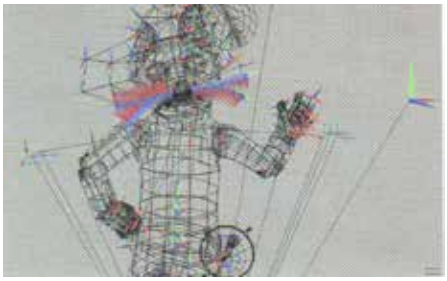
CHAPTER 5

3D ANIMATION

Digital tools have fundamentally changed an art that has been, for the greater part of its existence, a pencil and paper medium. Think about that for a second. Every animated feature film from the early 1900s to the late 1980s was a traditionally hand-drawn or stop-motion animated film. The tools used to make these films did not change significantly in almost 80 years.

In the mid 1970s, incredible leaps in computer technology began to take place. New 3D software began to emerge. In 1980, IBM licensed DOS from Microsoft, marking the beginning of computers available to the masses. In 1983, the Macintosh followed. Computer Graphic Imaging (CGI) was in its infancy, and there were but a handful of companies creating images for film

Opposite: Sully from *Monsters, Inc.*, 2001



and television. Primarily there was New York Institute of Technology (NYIT); Magi Synthavision in Elmsford, New York; Information International Inc. (III) in Los Angeles; and Digital Effects (DE) in New York City. In 1981, Disney contracted III, Magi, DE and Robert Abel & Associates to create computer graphics for the movie *Tron*.

The 1980s brought about events that moved technology forward, but it also brought events that would have lasting consequences for feature animated films. In the 1980s, Hanna-Barbera (the largest producer of animation in the U.S. at the time) began using computers in their animation process. In the 1970s, Marc Levoy developed an early computer-assisted cartoon animation system, which was used by Hanna-Barbera Productions to produce The *Flinstones*, *Scooby-Doo*, and other shows. The traditional animation skills of drawing and inking began to give way to digital manipulation to produce new forms of animation.

The Rise of CG

We talk about the history of the medium to encourage artists to pay attention and be aware of the trends and shifts in their chosen field of work. This evolution from 2D to CG did not happen overnight, but many 2D and CG artists (not to mention studios) were unprepared for the changes that were coming fast and furious. Reluctant at first to pick up the new tools, many masters of hand-drawn animation were understandably wary of

giving up a craft that took years, if not decades, to become proficient at. At the same time, many CG artists were not even trained in animation. The term "digital artist" was almost nonexistent as recently as 20 years ago. The phenomenal growth of the CG industry, due in part to the massive increases in technology and the rapid influx of computer-based talent, contrasts markedly to the snail's pace of growth in 2D from the days of *Steamboat Willie* (1928) to *The Lion King*, this quick growth caught many off guard.

Translating 2D Drawings into CG

"I think it comes down to clearly recognizable shapes. In most cases, I'd also apply the rule that less is more."

—Bernd Angerer

The most difficult task in taking a hand-drawn character and bringing it into the world of CG is upholding the charm, warmth and appeal that live in the sketch. It takes many revisions to keep that charm alive. A modeler with a keen sense of the aesthetic is vital to a successful crossover. Equally important in that modeler is the technical understanding where the topology should lie to support clean deformations in tough areas such as shoulders, hips and tight spaces within the joints. It is best to think about the character in parts when designing it in 2D. This will help the modeler and rigger understand how the character is expected to move.

Just like in animation, simplicity is always the best rule. The more bits you add, the more complicated the model will be, and this will affect every part of production from there, including rigging, skinning, texturing, lighting, animation, and so on. Bernd Angerer has a good idea of how to keep a character simple in design for CG: "I think it comes down to clearly recognizable shapes. In most cases, I'd also apply the rule that less is more."

Opposite: Puss in Boots CG process steps, *Shrek 2*.

> “2D has a kind of freedom that is difficult to reproduce in CG. In 2D, the artist can draw what he/she wants. He can make use of squash and stretch techniques that are easy to draw in 2D but had to duplicate in CG. In CG you are bound to physical restrictions. You can only work on an enclosed, controlled environment. Facial in a character is probably the hardest thing to duplicate in CG. In 2D, the artist usually deforms the face in ways that are physically impossible.”
>
> —Javier Solsona, *Rigger*

Character Modeling

Simplicity enables the animator to create a more clear performance as well. Simplicity will enable the model to work with the technology more easily. Work closely with your modeler to create a design that will work smoothly with the technology and not fight against it. Read the script and assess every possible type or extreme of movement that might come up.

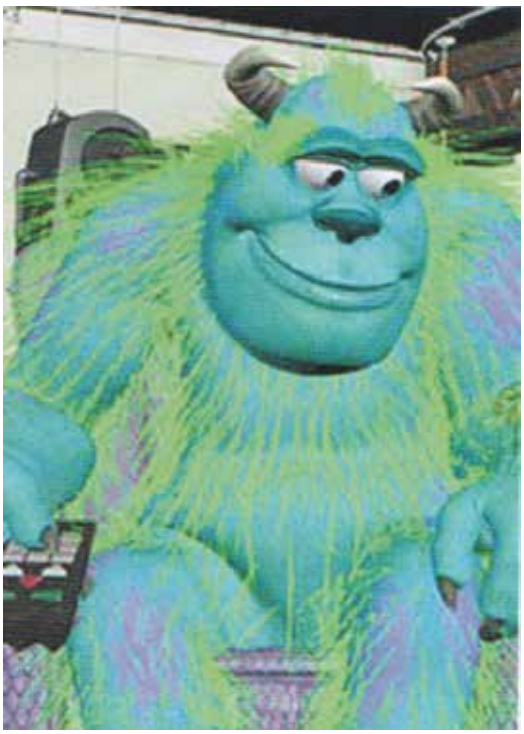
If your character is an animal on all fours, but there is a possibility that it might have to get up and walk around convincingly on two legs, you must think about how to build the mode to deal with this technicality, or it will look broken when animated.

The old saying goes, “Design your characters to work from any angle.” It is crucial to provide the modeler and rigger with as many drawings as possible. Rigger, Javier Solsona explains why this helps him create the most powerful rig:

> “It’s great to be able to see what the character is supposed to look like and what kind of poses, expressions, et cetera, it’s supposed to hit. This provides the ground on which to base the model and ideas on how to build the rig.”

Opposite: Concept of CG effects for Sully’s fur, *Monsters, Inc.* 2001.

However, the artist using pencil and paper can easily go off model. It is crucial for the artist to maintain structural integrity when drawing the turnaround model sheets. If not, the modeler is subject to using creative license in deciding which drawing he should follow. You should provide the rigger and modeler everything in the following list for your character to successfully translate to CG:



- Emotive drawings showing extreme attitudes and gestures.
- Structural drawings that illustrate where you intend flexibility and joints to be placed within the skin.
- Face charts for the modeler to build the facial rig and blendshapes from.
- Watch volume when you are drawing your face charts.

CHAPTER 6: PRINCESS MONONOKE

CHAPTER 7: SPIRITED AWAY

CHAPTER 8: HOWL'S MOVING CASTLE

ANIMATED MOVIES

CHAPTER 6

PRINCESS MONONOKE

Princess Mononoke was by far the most ambitious project attempted by the director and the studio. It was ambitious in every sense, not only because it has a complicated yet tightly controlled plot involving matters of great seriousness—of Miyazaki's own creation—or because, at about two and a quarter hours, it is one of the longest animated movies ever made, but because Miyazaki believing at the start of the project that it would be his last movie as director—determined that it should be his masterpiece. There is barely a skimped cel throughout its prodigious length. This is a movie made with love and it shows.

Opposite: Background drawing of the watchtower, *Princess Mononoke*.

The Title Dilemma

Despite the movies title, the story is really that of the princeling Ashitaka, expelled from his village for having incurred a supernatural wound while saving his people from a rampaging, crazed god-boar, and set to roam the world; in plot terms, San (the *mononoke*, or monster) plays only a subsidiary role. This idiosyncrasy of titling arose because the movie was initially intended to tell San's story; during the project's development, however, the focus shifted to Ashitaka.

In fact, while it is true that the movie is Ashitaka's story and he is certainly the central character in terms of screen time and the role he plays, it is San, the *Princess Mononoke*—the orphan who has chosen to reject humanity, having been raised by the goddess-wolf Moro, alongside her own brood—who offers the most powerful icon of the movie. Ashitaka is an individual worthy of all the respect we can offer him for his courage, fortitude, wisdom beyond years, strength of character; and so forth, yet from this movie he does not emerge as a particularly distinct personality. San is an entirely different animal and, although her part is the smaller one, steals the emotional fulcrum. Miyazaki has always been excellent at characterization, and for the princess-monster, he pulled out all the stops. She has the almost alien hostility of the wild animal in her gaze, and when she moves in her crouching scuttle, nearly on all fours, it is with a speed and gait unknown to the human species. There seems to be about her unkempt form a nimbus of silver-gray negative light that sets her apart from the ordinary mold of humanity, yet she is in very human terms extraordinarily beautiful, a child-woman and a fully mature female creature all at once.

This idiosyncrasy of titling arose because the movie was initially intended to tell San's story; during the project's development, however, the focus shifted to Ashitaka.

Opposite: Concept drawing of Ashitaka, *Princess Mononoke*.

"I don't try to create according to a particular model of the world...my world is one part of a larger world."

—Hayao Miyazaki

The Film

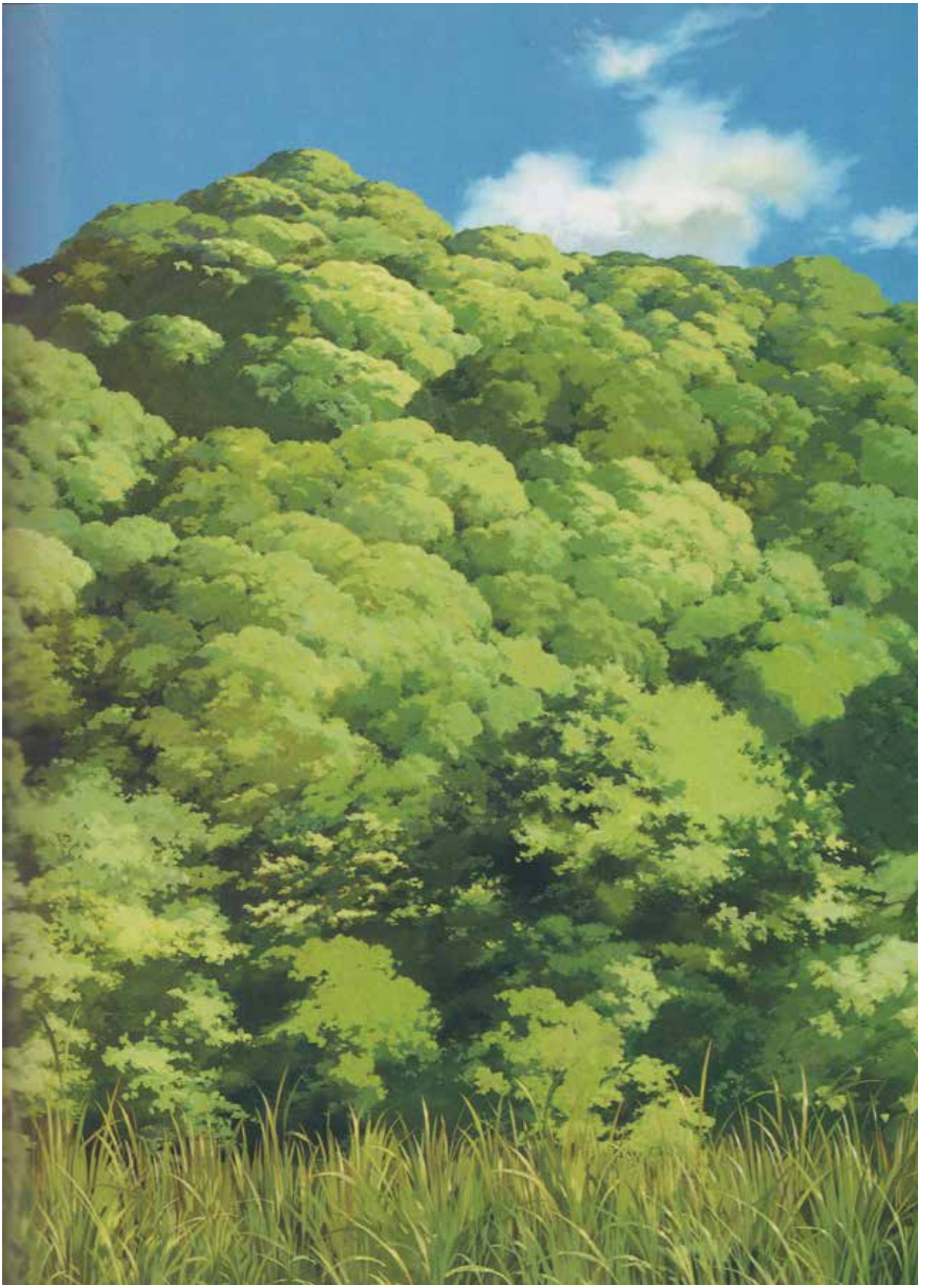
Princess Mononoke (1997) is high fantasy of a conceptual sophistication and complexity rarely found in the written form of this subgenre and hardly at all in the cinematic form. Although the movies resolution is in fact perfectly satisfying from a philosophical viewpoint, it does not concur with the demand by Western commercial movie makers that there must always be a happy-ever-after ending. In this way of thinking conclusions without all the ends tied off neatly are fine for art-house movies, but commercial animated moves are axiomatically regarded as products for children; children are incapable of dealing with good and evil in terms other than straightforward black and white—so the bad guys should be destroyed and the good guys should emerge as complete, not partial, victors.

Mononoke exemplifies the reasons why such a line of thinking is fallacious. First, it is an animated movie primarily designed for adults rather than children—and Miyazaki has the sense to realize that such sweeping divisions of audiences into adult and child are artificial, grafted onto movies by the preconceptions of the movie industry and of the public alike: they are not inherent to the movies themselves. Second, even if the movie were aimed particularly at children, children are perfectly capable of appreciating indefinite conclusions to conflicts and of perceiving the many shades of gray that exist in the debate between right and wrong. Third, the human condition itself hardly ever leads to trite, simple resolutions; there is no reason why animated movies should not attempt to reflect real life rather than fair tale in this respect.

Above: Opening scene, in which Ashitaka and his grandfather see approaching Demon God from the watchtower, *Princess Mononoke*.

Computer Graphics

Studio Ghibli's CG Department was in charge of CG (computer graphics) image processing for *Princess Mononoke*. The CG Department team worked in close coordination with other departments, including camera, painting, post-production, and special effects. The following is an interview with CG director Yoshinori Sugano, who is the head of the CG Department, that examines the making of the computer graphics for *Princess Mononoke*.



Interview with Yoshinori Sugano

Question: *Princess Mononoke* is the first major Studio Ghibli film to make extensive use of computer graphics and digital technology. What goal did you and the Computer Graphics Department staff have in tackling this assignment? What problems did you encounter?

Sugano: First, Mr. Miyazaki asked us if we could create a three-dimensional computer graphics sequence for a snakelike mass of tendrils growing from the Demon God called Nanzen Nanman. This was the hardest assignment—it was extremely difficult to integrate a three-dimensional object made by computer graphics into cel animation.

Computer Graphics is a realistic medium. You can create natural gradations of shadow with photographic accuracy, but with animation made from painted cels, shaded and lighted surfaces use completely different color grades. No computer program yet made can handle that kind of image processing.

Ordinarily, computer graphics animation produces images like the ones in Toy Story. But Mr. Miyazaki wanted computer images that could be seamlessly integrated into cel animation, so we had to begin by developing software that could do that. We asked Microsoft to develop software that could mimic the feel of thickly applied paint, sharp contour lines, and other characteristics of cel animation.

As a result of your partnership with one of the world's leading software makers, you were able to develop the Toon Shader software program for *Princess Mononoke*. In the CG Department you use computers made by Silicon Graphics, which has a strong reputation in the film industry, and software from Avid and other software makers in the United States, England, and Canada. Given all these resources, it seems somewhat paradoxical that you deliberately made images that don't look like computer graphics.

Opposite: Background forest drawing, *Princess Mononoke*.

Computer graphics can be used in various ways. It's all right to use them in a flashy way so that people know they're computer graphics, but in *Princess Mononoke* our goal was to make computer graphics images conform to the level of realism you find in cel animation. We wanted to present these images so they wouldn't look out of place in a flat two-dimensional animated environment. We didn't want them to stand out in some odd way. At the same time, we wanted the kind of solidity and presence that is only possible with computer graphics. That was also the aim of Mr. Miyazaki as a director. Basically, we wanted to use computer graphics, but retain a hand-drawn flavor in the final image.

What exactly do you mean by images that can be created only by using computer graphics?

One example would be when we need a feeling of depth or a sense of place. In scenes of Ashitaka riding Yakkuru, we can produce a more realistic feeling of speed and three dimensionality by creating a three-dimensional space with the computer and having the camera seem to move inside it. We can give the animated character the same presence as a human character riding over an open plain. Of course we are working with cels and images photographed from cels, but by using computer graphics and digital technology we can create and composite images in ways that would be impossible with conventional photographic techniques alone. The range of what we can express has become much greater.

Tasks that require a great deal of time and effort when done by hand, such as painting and multilayer compositing, can now all be done on the computer screen. You told me that the digital technology used in *Princess Mononoke* can be roughly divided into three categories: computer graphics, digital compositing,

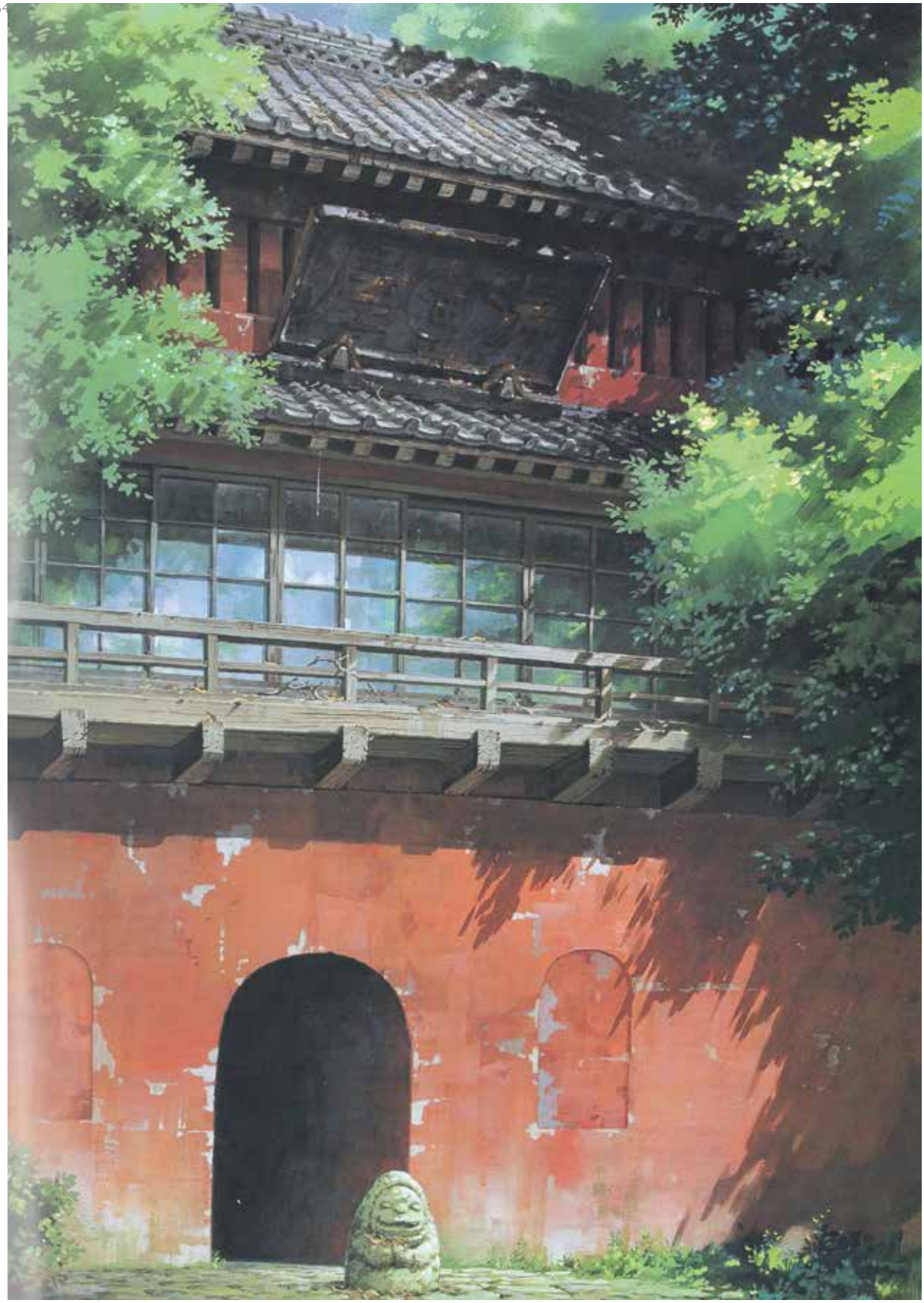
"Of course we are working with cels and images photographed from cels, but by using computer graphics and digital technology we can create and composite images in ways that would be impossible with conventional photographic techniques alone. The range of what we can express has become much greater."

—Yoshinori Sugano

Opposite: San with wolves, *Princess Mononoke*.

and digital painting. We'll talk about digital compositing and painting later, but first let's discuss computer graphics. Here again we can define two broad categories of CG techniques: one used for creating three-dimensional images and the other for image processing, that is, the production of cels and backgrounds on the computer.

When most people think of CG, they imagine the generation and animation of three-dimensional objects. The methods for doing that include mapping to integrate a three-dimensional model into a background and particle animation to animate light particles and other fine objects. In both cases, we basically follow the same procedure of first making a wireframe and then digitally processing the images in various ways, such as rendering and painting.



CHAPTER 7

SPIRITED AWAY

Ten-year-old Chihiro Ogino is an only child who's a little spoiled. On the way to their new house, she and her parents wander onto a small road, which leads them down a mysterious tunnel. After exiting the tunnel, they wander into a strange town. There she finds a bath house, where spirits visit to rest and heal themselves. As she wanders around the town, she encounters a mysterious boy who cautions her to leave before nightfall. But cursed for eating the town's food, her parents are turned into pigs.

Opposite: Concept sketch of the mysterious tunnel at the beginning of the film.

Chihiro's Mysterious Town

I would say that this film is an adventure story even though there is no brandishing of weapons or battles involving supernatural powers. However this story is not a showdown between right and wrong. It is a story in which the heroine will be thrown into a place where the good and the bad dwell together and there, she will experience the world. She will learn about friendship and devotion, and will survive by making full use of her brain. She sees herself through the crisis, avoids danger and gets herself back to the ordinary world somehow. She manages not because she has destroyed the "evil," but because she has acquired the ability to survive.

The main theme of this film is to describe, in the form of a fantasy, some of the things in this world which have become vague, and the indistinct world which tends toward erosion and ruin.

In everyday life, where we are surrounded, protected, and kept out of danger's way, it is difficult to feel that we are working to survive in this world. Children only enlarge their fragile egos. Chihiro's skinny legs and her sulky face are their symbols. However once the reality becomes clear and once she encounters crisis, she will surely be aware of the life she actually possesses and of a capacity for flexibility and patience, and for decisive judgment and action.

Most people just panic and collapse while shouting, "It can't be true." Those people will be erased or eaten up in the situation in which Chihiro finds herself. In fact, Chihiro's being strong enough not to be eaten up is just what makes her a heroine. She is a heroine not because she is beautiful or because she possesses a unique mind. This is the key characteristic of this work, and therefore it is a good story for ten-year-old girls.

Opposite: Scene from beginning of film, in which Chihiro is blown about by the wind, *Spirited Away*.

Above: Chihiro concept sketches, *Spirited Away*.

The Power of Words

Words are power in the world Chihiro wandered into, words have a great importance and immutability. At "Yuya," where "Yubaba" rules, if Chihiro were to say, "I don't want to do this," or "I want to go home," she would be eliminated by the sorceress. She would be made to wander about with nowhere to go until she vanishes or is made into a hen to lay eggs until she is eaten. On the contrary, if Chihiro says, "I will work here," even a sorceress can't ignore her. In these days, words are thought to be light and unimportant like bubbles, and no more than the reflection of a vacuous reality. It is still true that words can be powerful. The fact is, however, that powerless words are proliferating unnecessarily.

To take a name away from a person is an attempt to keep them under perfect control. Sen shuddered when she realized that she was beginning to forget her own name. And besides, every time she goes to see her parents at the pigpen, she becomes used to seeing her parents as pigs. In the world where Yubaba rules, people must always live among dangers which might swallow them up.

In a dangerous world, Chihiro began to come alive. The sulky and languid character will come to have a stunning and attractive facial expression by the end of the film. The nature of the world hasn't been changed in the least. I am arguing in this film that words are our will ourselves and our power.

This is also the reason why I created a fantasy set in Japan. Though it is a fairy tale, I don't want to make it like a Western type of story which allows many possibilities for escape, and is likely to be taken as a cliché. However, I would prefer to say that it is rather a direct descendant of "Suzume no Oyado" (The Sparrows Inn—a trap in which sparrows lure people by food and pleasant surroundings) or "Nezumi no Goten" (The Mouse's Castle—similar to "The Sparrows Inn"), which appear in Japanese folk tales. Our ancestors had been dining at the Suzume no Oyado and enjoying a feast at the Nezumi no Goten.

I created a world where Yubaba lives in pseudo-western style to make it seem as if it is something that has been seen somewhere else and to make it uncertain whether it is a dream or reality. And also, Japanese traditional design is a rich source for the imagination. We are often not aware of the rites, designs, and tales of the gods. It is true that "Kachi-kachi Yama" and "Momotaro" are no longer persuasive. However, I regret to say that it is a poor idea to push all

Japanese Folk Tales

Suzume no Oyado, translated *The Sparrows Inn*, is a trap in which sparrows lure people by food and pleasant surroundings.

Nezumi no Goten, translated *The Mouse's Castle*, is similar to *The Sparrows Inn*. "Our ancestors had been dining at the Suzume no Oyado and enjoying a feast at the Nezumi no Goten."

Although, Hayao Miyazaki wanted a fairy tale theme for *Spirited Away*, he chose to stick to the Japanese folk tales, especially the ones above, rather than Western fairy tales which tend to be perceived as cliché.

Opposite: Concept drawing of the Mysterious Town's transformation into the Spirit Town with Chihiro, *Spirited Away*.

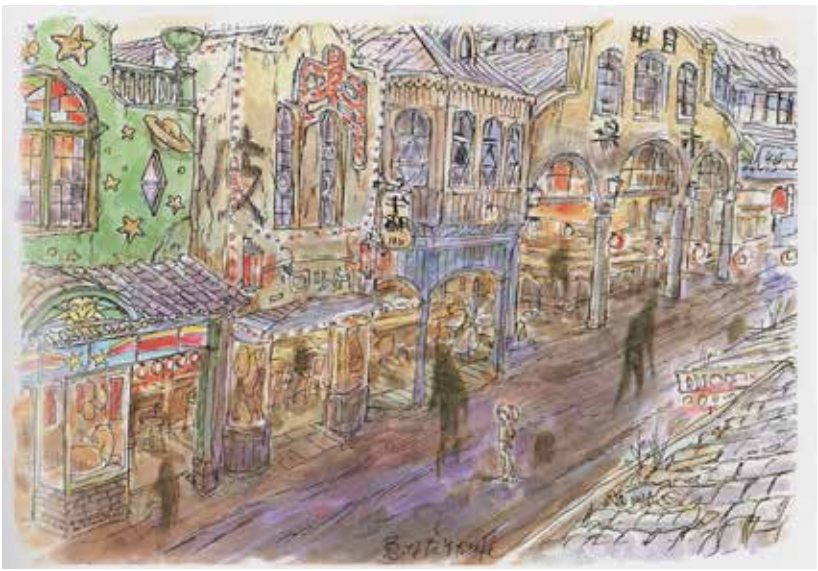
"I would like to make this film something through which ten-year-old girls can encounter what it is they truly want."

—Hayao Miyazaki

the traditional things into a small folk-culture world. Surrounded by high technology and its flimsy devices, children are more and more losing their roots. We must inform them of the richness of our traditions.

I think the world of film can have a striking influence by fulfilling the traditional functions, as a piece of vividly colored mosaic, to a story which can be applied today. That means, at the same time, we can gain a new understanding of what it means to be the residents of this island country.

In this borderless age, a man who doesn't have a place to put down his roots will be looked down upon. A place is the past and also a history. A man without history, or a people that forgot its past will have no choice but to disappear like a shimmer of light or to lay eggs endlessly as the hen and consumed.



Characters

Chihiro

"Chihiro's character wasn't based on a particular model. Apparently, Mr. Miyazaki had his producer-friend's daughter in mind, but by the time I was shown her photo, my work was already underway, and I thought, 'Well, she doesn't resemble her at all. Her body's thin.' But Mr. Miyazaki originally requested a pudgy girl, so that's why her face ended up being round. Although I made her body thin, I made sure her head and body weren't out of proportion." —*Ando*

Haku

"Haku is what Mr. Miyazaki often refers to as a *transparent* character. It's actually quite difficult to convey transparency, so I made his eyes look strange. They look into the distance, as if he has insight into a person's inner thoughts. I wanted him to be mysterious. I encircled his pupils at the center of his eyes with color. I thought the added color would make his eyes shine a little.

"I thought Haku would be more compelling if he was cold and mysterious. So, at first he looked grotesque as a dragon. I drew him as a snakelike dragon with reptilian scales, but it turned out this wasn't what Mr. Miyazaki had in mind. The final version of the dragon ended up having a more canine quality. It has a dog's face." —*Ando*

Kamaji

"At first Kamaji was just a plain old man, but then we came up with the idea of him having a whole set of arms, frantically working at once. So, by the time we finished the storyboards, that's how he looked. His build is more defined than it is in Mr. Miyazaki's sketches. We made him look old by adding old man's wrinkles, like the lines in his neck. Even from behind at an angle, he looks like an old man." —*Ando*

Susuwatari/Soot Spirits

Created from soot, Susuwatari are assigned to carry coal.

Yubaba

"In our previous project, which ended up being canceled, we had a character with many of the same characteristics as Yubaba. At that point, she was drawn as a grotesque character, the kind that might appear in the illustrations of *Alice in Wonderland*. We did this to emphasize the difference in height between her and the heroine. When we began this project, her face started out being large with heavy makeup. At first, we had her wearing a Japanese short coat, but given how she lived in a Western-style building, we gave her a more Western look." —*Ando*

Hayao Miyazaki's "policy for digital"

Spirited Away is a fully digital animated film. Digital animation is usually associated with images crowded with 3D objects, but that's not what we mean here.

"We consider *Spirited Away* as another step in the hand-illustrated cel-animation process developed through past Ghibli films. We took pains to ensure that CG did not call attention to itself in the film, so we kept the same approach we had for *Princess Mononoke*. CG shouldn't influence the art style. That's what makes Ghibli's approach to CG unique."

Atsushi Okui, whose position changed from Chief of the Camera Department to Director of Images, explained that he wanted to incorporate digital technology into the film without being overwhelmed by it:

"Thanks to CG, we're no longer limited by analog processes. To put it simply, backgrounds and concept art are drawn on paper but once they're digitized, you can do anything. Colors and other new elements can be added to backgrounds. Concept art can be separated according to various elements and processed accordingly. It's amazing what's possible.

"For example, the character No Face was drawn on a single piece of paper by one of the animators. The camera department then processed the elements of his face, arms, legs, and body, which were separately created by the painting staff. That's how it was possible to combine both terrifying and humorous elements in the character. No Face was created as a result of the unprecedented close coordination between the animation department, the painting staff and camera department.

Previous Page Verso-Top: Hesitant Chihiro urges her parents to return to the car as they travel into the mysterious tunnel.

Previous Page Verso-Center: Haku rescues Chihiro from disappearing in the Spirit World.

Previous Page Verso-Bottom: Chihiro flies above the town on the back of Haku in his dragon form.

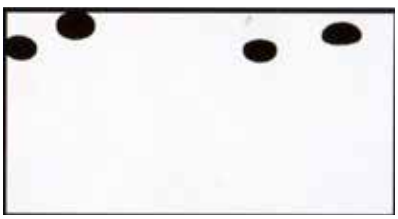
Previous Page Recto-Top: Kamaji, head of the boiler room in the bath house.

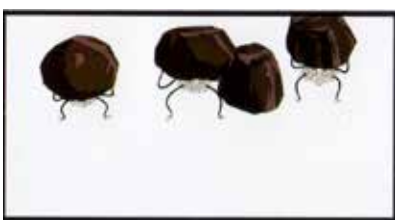
Previous Page Recto-Center: Kamaji's loyal Susuwatari/Soot Spirits, who carry coal to the furnace.

Previous Page Recto-Bottom: Yubaba, the sorceress in charge of the bath house.

Opposite: CG composite steps for rendering Susuwatari/Soot Spirits.

The character "No Face was created as a result of the unprecedented close coordination between the animation department, the painting staff and camera department."





"With my new position as Director of Images, I felt more responsible for the overall results of the entire film. My work has expanded with digital animation. But extending myself too far could also effect the other departments. Mr. Miyazaki tells me it's all right to make changes with each supervisor's permission, but it's easier said than done.

It's only natural to get upset by an intruder. At Ghibli, it's no different. With the utilization of digital technology, the cel-animation production system had to be completely reevaluated. That was how Mr. Miyazaki came up with the idea of holding 'production meetings.'

"When we worked on the previous film, *My Neighbors the Yamadas*, which was our first attempt to make an all-digital film, I'm sure our workplace looked chaotic to Mr. Miyazaki" digital animation supervisor, Mitsunori Kataama laughs. Kataama worked in the same office as Okui.

"In most animation productions, once the storyboards are finished, only the animators and art staff hold meetings. The CG staff would only communicate with individual departments after the backgrounds and animation were completed. This time, Mr. Miyazaki and the heads of all the departments met after the storyboards were done in order to discuss how we would process every shot. Of course, we couldn't be terribly specific, since we only had the storyboards, but the meeting clarified Mr. Miyazaki's directorial approach, as well as the tasks assigned to each department. The departmental representatives had never held meetings like this before. As a result, the work proceeded incredibly smoothly. This time, since he was completely immersed in digital technology, Mr. Miyazaki claimed his experience was very fulfilling. He continued to remind us, though, that restraint was essential or else we would end up with poor results.

"Animation is definitely going to change."

—Mitsunori Kataama

"When we began production on *Spirited Away*, Mr. Miyazaki announced that he would not alter any of the backgrounds digitally. But once we began, he requested changes like, 'add a little purple here, or dim the shadow there.' Mr. Miyazaki then claimed it was unavoidable. It would be silly to reject something you could do. But you had to do it with supervision. If something was going to be changed, Mr. Miyazaki insisted on a policy where it was checked with the supervisor in charge. He found all of this interesting. Until now, whether you liked the results or not, you had to use the completed backgrounds and animation as they were. Now, for example, if a character is too big, we can shrink it down to 96% with digital technology. I believe we discovered the merits of digital technology. It's essential though, as Mr. Miyazaki insisted, to exercise restraint and maintain 'a policy for digital.' The production meetings helped us to clarify these approaches."

CG to Construct the Image

With the incorporation of digital technology, the animation production system must change along with the entire film-making process. "Everyone felt the limitations of cel animation," Kataama claims. "Animation is definitely going to change."

"But Ghibli's philosophy won't change. I wouldn't go so far as to call it a motto, but it's true that everyone at Ghibli has the fundamental drive to make something 'beautiful.' Beautiful backgrounds, beautiful sights. There's a lot of sludge and garbage in *Spirited Away*, but even those have to be visually stunning. I'm not saying it has to be flashy or sleek. We believe

Opposite: Lin waiting on the water for Chihiro, *Spirited Away*. Digital processing of the water was a further improvement on techniques applied to sea animation sequences in *My Neighbors the Yamadas*.

we can make beautiful images by depicting them naturally. That's our aim, but there's a physical limitation to cel-animation and celluloid film. Atsushi Okui and I often say that an image looks more natural the more you work on it. If the work on the image leaves something to be desired, then it will look unnatural and odd. You have to put in as much effort as you can to make it look natural, so that the audience won't even notice the effort we put in making these images."

But isn't it a pity to have all this CG technology ignored by the viewer? "That's fine actually," Kataama replies. "The thing is, *Spirited Away* wasn't produced by CG alone. CG is only a step in making these images. Okui and his camera staff assemble the images. We take care of the elements that can be processed easily. Just because everything can be done by CG entirely doesn't mean it should be 100% CG. For example, the supervision of lighting and other effects comes from the camera staff. Their prior experience is absolutely essential to our current work.

Above: Bath explosion sequence after Chihiro frees the River Spirit. Explosion was created with the combination of light reflections and shadows. *Spirited Away.*

The Number of Colors

CG is being widely used in Hollywood movies and television commercials. The wide range of possibilities it offers are incredibly impressive. In a way, CG provides a magical tool making any object appear on the screen. On the other hand, there are those critical of digital animation insisting that it looks empty and superficial.

Kataama sees why: " There aren't enough colors. Most digital animation made in Japan have 16, 770, 000 colors, which means it's in the 8-bit format. That sounds like a lot of colors, but it's actually very minute. Celluloid film is very sensitive. When an image lights up on film, it doesn't turn white immediately, but changes gradually before turning white. In the 8-bit format, there are only 256 degrees in RGB [Red, Green, Blue], so the change from dark to bright comes in even stages. There aren't enough gradations in 8-bit when you try to express light, so the colors jump.

"The human eye is very sensitive to light and darkness, so it can detect the color shift, and that's the weakness of the 8-bit format. *Princess Mononoke* was only 8-bit, so we ended up unsatisfied with the lighting in that film. The 16-bit format was only fully applied with *My Neighbors the Yamadas.* The 256-color system was inadequate to depict the faint colors of watercolors. So the background digitization and character composites were both converted to 16 bits. 16 bits is 16, 770, 000 colors squared, so it offers an astronomical number of colors. That's the only way you can achieve the variety of color celluloid film offers."

Application tools for 16-bit are utilized both by the CG Department and Camera Department. But even if the software

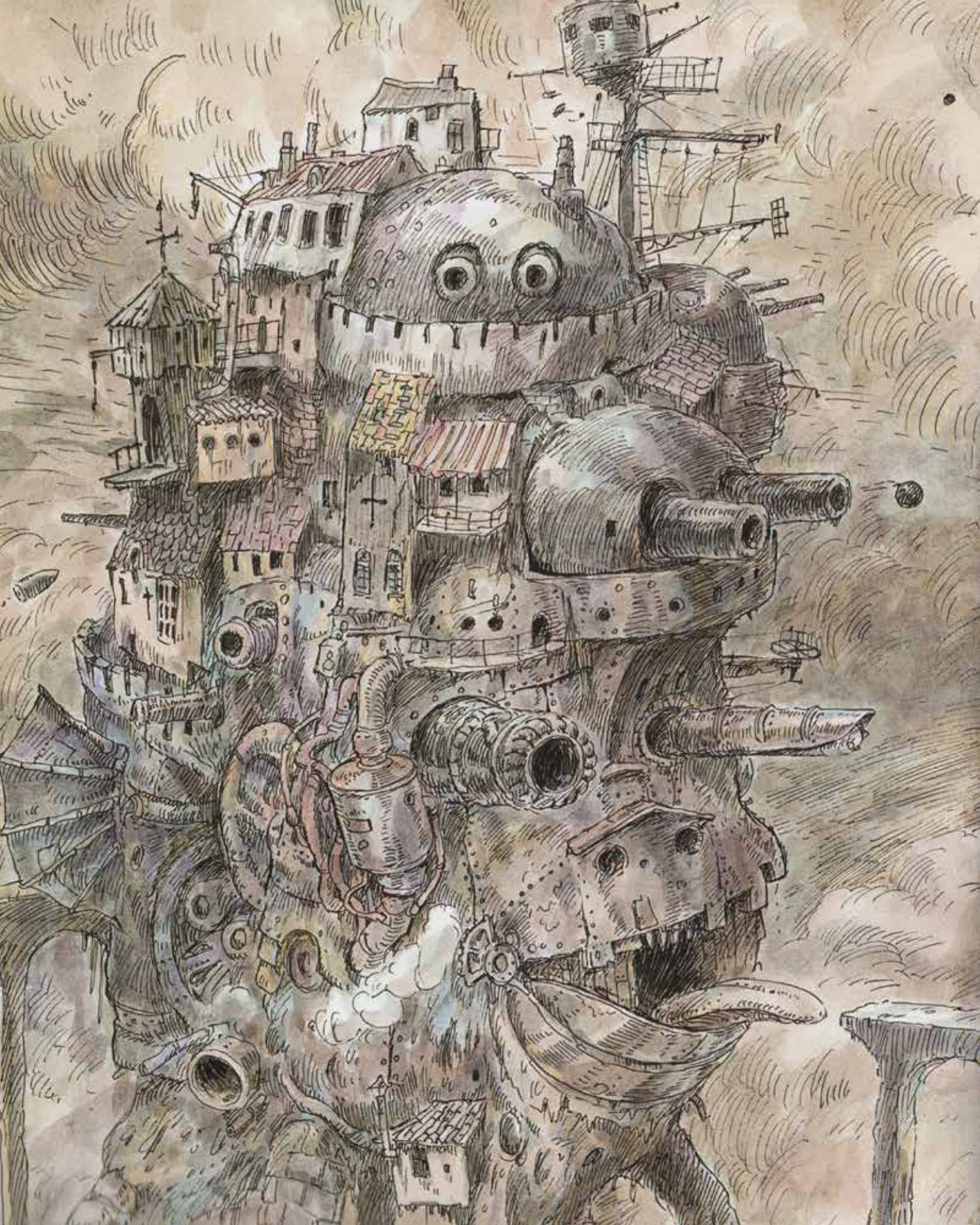
calculations are in 16-bit, corresponding output hardware is still unavailable. Current computers don't have the technology to display 16-bit animation. "Well, we just had to rely on our knowledge and feel. Right now we can only assume that if it looks good in 8-bit then in 16-bit it will look fine."

Digital technology has opened up many unanticipated possibilities for animation production.

Even though digital technology is considered flawless, as long as it remains a tool it has its limitations. The staff at Ghibli are trying to go beyond the limitations inherent in various software and hardware. If the film production tools they need don't exist, they've decided to produce them on their own.

"We hired computer programmers for Ghibli from *Princess Mononoke* onward. Current software doesn't exactly meet our requirements. So we end up having to compromise. So we decided many programs. With digital paint you slab on a single color but with cel animation even one color isn't really just one color. That's why digital paint can look bad. It's especially obvious to any viewer when the digital data is directly converted to the DLP format without any celluloid involved. There were only four theaters in Japan that could project this format, so in order to produce softer images, we had a program developed that would add slight noise to them. These are small tools we have programmed, but I believe they will be absolutely essential for future animation projects."

Digital technology has opened up many unanticipated possibilities for animation production.



CHAPTER 8

HOWL'S MOVING CASTLE

Howl's Moving Castle is set in a world conceived by the late 19th century European neo-futurist painters where magic and science co-exist. One day, a witch of the wasteland puts an 18-year-old girl named Sophie under a spell, turning her into a 90-year-old lady. The aged Sophie encounters the wizard Howl. She begins her strange life with Howl at his castle, the formidable walking fortress.

The wizard Howl's moving castle is powered by the fire demon Calcifer; the noisy castle emits steam and roams around like a living creature. The castle is covered with houses, cannons, and other disparate parts including ears and assorted junk. The interior includes a living room/kitchen, bedrooms for Howl and Markl, and a bathroom.

Opposite: Concept sketch of Howl's Moving Castle.

The film is based on the book *Howl's Moving Castle* (published in the U.S. by HarperTrophy, by children's book author, Diana Wynne Jones). The book was adapted by Miyazaki who concentrated on its "war love story." He drew countless concept sketches to convey the unique world of *Howl's Moving Castle*.

Before its nationwide release in Japan, *Howl's Moving Castle* premiered as the first Japanese animation entry at the 61st Venice International Film Festival in 2004 where it received the Golden Osella Award.

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Production Synopsis:

September 2002, approximately one year since the release of *Spirited Away*, 2001, the animators at Studio Ghibli were on hiatus, while the main staff embarked on a research trip for Miyazaki's new film *Howl's Moving Castle*. The staff visited Europe for 12 days and, although their research centered on the eastern province of Alsace in France where the film was set, they also spent time in Heidelberg, Germany and Paris. Visiting the Alsatian city, Colmar for its color and atmosphere proved to be a productive experience for the staff.

After returning from their trip, they began working on pre-production tasks including character designs and art concepts, as well as digital animation tests for Howl's castle's movements. Miyazaki worked on concept sketches and storyboarding in November.

January, 2003, testing for the castle's movements and the main character designs were finalized. On February 1, Saturday, the animators returned from their hiatus to Studio Ghibli, marking the official commencement for the production of *Howl's Moving Castle*. The first rushes for the film company screenings of shot sequences were shown approximately six months later on July 18, twenty-eight scenes were screened.

Opposite: Background drawing of the house for the lake scene, *Howl's Moving Castle*.

January, 2004, the storyboards Miyazaki began over a year ago were finally completed in November, 2002. Toho's scheduled release date of early summer was postponed to the fall. Production work continued smoothly with the first voice-over recording conducted between April 12 and April 17. On June 3, Miyazaki completed checking key animation. On June 9, the supervising animator's work was completed and by the end of June, most of the work including in between/clean up animation, art, digital painting, digital animation and digital shooting was finalized. The second voice-over recording was conducted between June 5 and June 17 and the dialogue, music, and sound effects were mixed to the entire film in July. The first test screening was held on August 3, marking the completion of *Howl's Moving Castle*. Its running time is 119 minutes, 11 seconds. The film consists of 148,786 animation sheets. The first run, domestic release in Toho-Yoga film theaters began on November 20, Saturday.

Background Art

"I incorporated Western painting techniques and images into the background drawings. Noboru Yoshida and I worked as art directors for this film. Our approach in style (including colors) is completely different. This film is filled with landscapes, and I think the variety in colors and atmosphere came from our work being combined.

At the initial stage, the director referred us to the work of an illustrator named Albert Robida (1848–1926) who was prominent at the time. For architectural styles, we based the overall setting on the wooden architectural style called "half-timber" so prevalent in German and English homes. We visited the French Alsatian city, Colmar. The light and atmosphere of the city, the reddish cobblestone streets, the drifting clouds, and sunlight left such a strong impression on us [that] they were incorporated throughout the film.

Most of the films I had worked on were set in Japan so this was the first time I drew European cityscapes. It was difficult to restrain my ingrained Japanese approach to color, so Miyazaki would often instruct me to make my colors 'brighter and more colorful.'

I had experience in oil painting, so I incorporated Western approaches to colors and space into my work. For example, I thought of the lighting and atmosphere in Vermeer's paintings when I was working on the scene where Sophie quietly works away in her workshop, although I'm not sure I succeeded. There are Western paintings, particularly those by the Impressionists, where the objects aren't drawn in detail. The lighting depicts the space instead. By trial and error I tried to emulate that sensibility. It was very difficult, but I hope my drawings not only depict each object, but also convey lighting and sunshine."

—**Yoji Takeshige**, *Art Director*

Opposite: Concept background painting of Howl's Moving Castle.

Background Art

"I drew the background for the opening wasteland scenes, the high moors where Howl's castle relocates, and Suliman's greenhouse. Because the film was set in Europe, the art directors Yoji Takeshige and Noboru Yoshida had begun by depicting foreign settings in their concept art. They were very adept at evoking this atmosphere because they were both trained in oil painting. The concept art was very evocative. I first began by examining their work and research photos, but my drawings still ended up looking Japanese. Even the mountains I drew didn't have the colossal look of rocky mountains like the Alps or the Tian Shan mountains. They were more like the triangular mountains you see in Japan. I was trying my best to draw different mountains. Maybe the northeast landscape I grew up in somehow managed to seep into these drawings.

I didn't make a conscious effort to choose foreign-looking colors. My colors tend to be washed out so I made an effort to use thick colors for the tropical plants in the greenhouse. The flowerbeds in the high moors had to be pretty, so I really spread them all over the drawing. I did a lot of drawings for this scene including the clouds and high moor slopes, but it was easy since I love drawing nature scenes. Drawing all those dots in the distance was pretty trying though. I got pretty tired of it (laughter).

None of my work was done in the studio for this film, so when I saw the first cut, I felt objective as if I were watching something I didn't work on. I did draw backgrounds including the farmhouse scene where the aged Sophie rides the horse cart and some of the buildings in the city. But they weren't as detailed as the drawings by other staff members. For example, the drawings for Howl's bathroom

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—Kazou Oga

Above: Background for the lake scene, *Howl's Moving Castle*.

really conveyed a filthy look, but the detail is also incredible. I'm sure it wasn't easy, but I really admired the staff's work. Both in terms of detail and quality, the art, camera and CG staffs at Ghibli are constantly improving. I no longer worked at the studio, so I missed having the usual opportunity to learn from my informative, at times casual, discussions with Miyazaki.

For example, the initial background art I drew for the tea scene where Sophie and Markl stare at the lake apparently clashed with Miyazaki's approach. In keeping with the cloudy sky, I drew the lake with somber colors, but Miyazaki wanted me to brighten the water surface so its beauty would be otherworldly. I realized this was a special scene where this beautiful lake would make Sophie feel peaceful. The storyboards also emphasized how the landscape is supposed to be "incredibly beautiful." Instead of drawing a realistic nature landscape, I should have understood the impression it was supposed to give the viewer when I worked on the drawing. I realized I couldn't just rely on my own experience and knowledge to draw the appropriate background art."

—**Kazou Oga**, *Background Artist*

"The castle isn't just part of the background."

—Hayao Miyazaki

Computer Graphic Images

"This was my first film where I concentrated on my character's movements. In keeping with the film's title, *Howl's Moving Castle*, Miyazaki explained to me before I began working on the film, 'The story won't work without the castle moving. The castle isn't just part of the background. It's a character, so I want you to treat it as a protagonist.' He also told me, 'We'll be using lots of CG in this film,' which I already assumed for the castle's movements. We still didn't really have the technology to move Sophie or Calcifer, but I thought it might be possible with a castle.

In all our previous films, CG work primarily revolved around providing movements for the background art. But as I worked on the recent films such as *Princess Mononoke*, *My Neighbors the Yamadas*, and *Spirited Away*, I increasingly felt the urge to create more dynamic movements. This was my first film where I concentrated on a character's movements.

My experience in approaching the castle as a character to create its movements made me realize how interesting characters can be. Of course, I wasn't working on a real human character, but I had to approach the castle's personality as if it were human in order to express its human-like personality. The performative aim, in other words, the acting in each scene, was incredibly important to my work. I wasn't all that interested in character until I took on this assignment, but now I understand what people mean when they praise character depth in a film."

—**Mitsunori Kataama**, *Director of Digital Animation*

Opposite: Background concept drawing for the flag celebration, *Howl's Moving Castle*

Processing for the Castle

Howl's moving castle is depicted as a character. When Sophie encounters the castle for the first time, its movements convey the impression of being "scary," but once it stands still it looks "a little inviting." The castle's leg movements were a combination between the reptilian walk of a lizard and CG walk cycle. The close-ups for the legs were animation and the long shots were CG.

As soon as it became clear the castle's movements would be created with CG, I recalled the rubber multi-plane we used for the Ohmu in *Nausicaä of the Valley of the Wind*. I had in mind a perfected version of the rubber multi-plane for this film.

But the previous rubber multi-plane had many limitations. For example, not only were the movements for each part in the same direction, they could only be parallel. I had a feeling CG would add something fuller, enabling us to create movements where the castle would nearly fall over or open up like a fan. Also, any large movements would look flat, so I broke the castle down into many parts, making sure the cannon-like eyes on the castle's face looked three dimensional, poking out like tubes.

I also didn't want the castle's movements to be restricted to simple stretching and shrinking in the usual rubber multi-plane style. I wanted the movements to be much more dynamic.

When I first looked at the concept art for the castle, it looked like a pile of junk. The image reminded me of the accessories dangling from a mountain climber's backpack, so I thought of having the junk move as well. I would first create the movements for the main body and then have these other parts swing out of sync with the main body of the castle. Miyazaki at first wanted to try out a castle with ten legs. In the end, the task would have been too demanding. It turned out four legs was quite effective already, so we decided in four legs for the castle.

Castle's Movements

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—Noriko Takaya

Above: Castle parts for CG1, *Howl's Moving Castle.*

Opposite: Worm hole scene, *Howl's Moving Castle.*

We first began with a layout, breaking the castle down into each part based on Noriko Takaya's harmony processing that would "make the castle come alive." Taking into account the castle's movements, we would break down the harmony into data while analyzing each part's structure. There were no drawings for the joints or overlapped areas between the disassembled parts. Those areas were touched up with the stamp tool in Photoshop according to the movements of each part. That was how I completed the individual parts.

These parts were then formed into a polygon with 3D CG. I had to pay close attention to the overlaps between each part. By following the final design, I made sure the parts were overlapped in the right order.

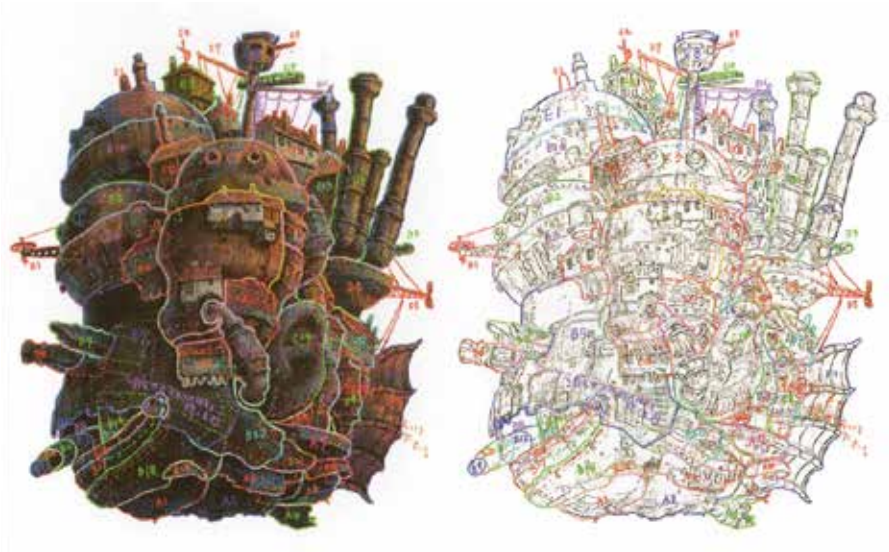
Atsushi Okui, the director of digital imaging, was responsible for the castle's steam and smoke, so he added a blur effect. Also, the constant chimney smoke was created during the digital composite stage, so it would match the CG castle movements.

Processing the Worm Hole

"I want it to look like a hole suddenly torn through the background art…it should look mysterious, like a black hole."

—Hayao Miyazaki

We called the CG processing for the shot where the ground turns into a worm hole, "processing the worm hole." Miyazaki said, "We can't convey the gradations of curves with cel drawings. Do you think it can be with digital animation?" That was how we ended up creating it with CG Miyazaki made specific requests for this shot like, "I want it to look like a hole suddenly torn through the background art," and "it should look mysterious, like a black hole." I knew I would need something that would pull the colors surrounding the gaping hole into the black abyss. We first created



a morphing hole with polygon and then added the background image onto its surface. I thought sending this image into the hole would create the kind of effect Miyazaki wanted. That's how I began my work. The first version was very graceful—it looked like a thin veil slashing inside the hole. But after looking at this version, Miyazaki said, "Make it more violent, as if this is the point of no return." So, we ended up with the current version. We had the hole morph in extreme to convey its overwhelming power. I created the paths (contours) to create this dynamic, but it was hard work given the time constraints we had in the final stage of production.

At the studio, we refer to CG generated three-dimensional objects as "CG objects." The battleship wings and the spinning objects in Howl's room were CG objects. We made the wings morph as they move. For texture, we pasted in harmony drawn by Noriko Takaya, but the outlines were generated with CG. Along with the outlines, the texture of the outlines was also created with a shader tool (a program that calculates texture) we developed for our studio. As the wings flap, the line texture changes along with the shade. We applied a cel art texture to the objects in Howl's room.

Above: CGI trace of Howl's Castle, *Howl's Moving Castle*.

Path Map

The storyboards only indicated a tracking shot, but the cuts where the camera moves in were all done with CG.

We refer to the traditional type of camera work such as background animation processing, the objects on the sheet and the camera move together, or the background can be drawn into the cel to allow complex camera movements (such as a veering shot) as "path map" at our studio.

Near the beginning of the film, Sophie and Howl are attacked by the blob men in the alley. This was a tracking (horizontal movement) shot where we applied path map. We also used it to enhance the movement in sequences including the scene where the camera pulls back, revealing the gang of blob men, as well as the scene where Howl and Sophie leap up into the air. We used path map most extensively in this scene. It was also used in the shot where the camera pulls back as Sophie enters the filthy bathroom and the tracking shot in the royal court plaza.

Morphing

Morphing is a process where shapes are overlapped (previous images are dissolved into the subsequent images, also known as O. L.) and modified.

Morphing is a process where shapes are overlapped (previous images are dissolved into the subsequent images, also known as O. L.) and modified. Reference points A and B are determined for the process. It was used for the shot where the Demon God rots away at the beginning of *Princess Mononoke* as well as the sequence of mud sliding out of the River Spirit in *Spirited Away*. In both cases, though, the movement was very simple. This time I wanted to add a swaying motion.

In the shot where Howl desperately summons the spirit of darkness because of his tarnished hair, we processed the image so that the time interval of transformation would be uneven across the entire image. The uneven parts were separate from the background art and created digitally. The unevenness determined the transformation time. That was how we achieved the wavy motion resembling curved glass.

Castle Harmony

"After working on *Porco Rosso*, 1992, I stopped working on animation films. I resumed recently when Miyazaki invited me to work on the animation short films, *Imaginary Flying Machines* and *The Invention of Imaginary Machines of Destruction* screened at the Ghibli Museum exhibit, *Castle in the Sky and Imaginary Science Fiction Machines*. The subsequent film I worked on was *Howl's Moving Castle*.

When I first began, Miyazaki repeatedly reminded me, 'the castle is a character.' For example, the castle is revived after falling apart later on in the film. He wanted me to depict its vitality and strength to revive itself in spite of its wrecked state. Unlike my previous harmony processing, which consisted of matching the movements to the background art, this harmony had to provide the castle's personality.

The harmony process, which involves applying colors directly on the back of the cel, hasn't changed at all though. I mainly used poster colors for my materials, mixing them with cel paint to make them stick to the cels.

I supervised the harmony process for Howl's castle, the flying ships, and Howl's relocation, as well as the detailed interiors of Howl's room. I based the castle harmony on Miyazaki's storyboards and art director, Noboru Yoshida's concept art. Miyazaki told me the colors should be "rusty and worn, like a pile of junk." I added colors that would look rusty, but it looked too cluttered, I wanted to use many colors that were variation of similar colors but the results had too many colors. Yoshida's concept art was very romantic, but the castle I drew for harmony ended up looking really rough and crass. I'm sure Yoshida was offended by my drawings (laughter)."

Above: Poster concept for *Howl's Moving Castle*.

Opposite: Finished concept image of Howl's castle after CG effects, *Howl's Moving Castle*.

Harmony Process

Because there were so many different locations for the castle, I discussed my approaches with Yoshida to match my drawings to the background art. I matched my work to the time of day, whether it was morning or sunset, depicted in the background art. We never used the same harmony for another scene. Given these circumstances, the castle harmony was the most demanding work I'd ever done.

Because there were so many different locations for the castle, I discussed my approaches with Yoshida to match my drawings to the background art. I matched my work to the time of day, whether it was morning or sunset, depicted in the background art. We never used the same harmony for another scene. Given these circumstances, the castle harmony was the most demanding work I'd ever done.

The most difficult part for me was working on the scene where the flying ship flew over the burning city. The ship was supposed to be tinged with red from the flames below, but I just couldn't seem to convey the red tone, Miyazaki wanted. Instead of being the red of a flame, it only made the ship look red. I went through so many revisions for this scene without getting anywhere.

In the scene where Howl's castle relocates, Howl's magic ends with background art, but everything else up until that point is harmony. I had to draw the transformation of each piece of furniture. The total turned out to be a lot, but because I'd never done anything like this before, I enjoyed the process. While working on the drawings, I would look forward to the processing by Mitsunori Kataama, director of digital animation, and then Atsushi Okui, director of digital imaging.

This was by far the most time consuming project—even counting my previous work on Ghibli films. I celebrated my birthday twice (laughter), but the work was very stimulating."

—**Noriko Takaya**, *Harmony Process Supervisor*

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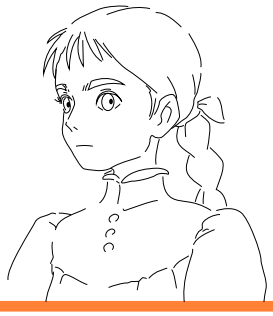

A journalist once dubbed Hayao Miyazaki "The Japanese Disney," and the epithet has stuck. While it was intended as a compliment, and while it must certainly have drawn additional Western viewers to the movies of this exceptional animator; it nevertheless does him a very great disservice. Miyazaki's movies are considerably richer than Disney's, in terms of storytelling, subtext, palette, and emotional depth. He is also much more of a hands-on animation director: to cite a single example, of the almost 150,000 cels in *Princess Mononoke* (1997), Miyazaki personally altered or touched up no fewer than 80,000.