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26. Geothermal Legacy from the Early Filipinos and Later Migrants

by
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Abstract: The early Filipinos did not make much use of the terrestrial heat so abundantly manifested in the region. However, they may have used a mixture of oil and bits of sulfur-rich rocks for medicinal and mystical purposes. References to fire or heat were associated with volcanoes, which early Filipinos revered as homes for their gods and as symbols of fair maidens in myths and legends. Later migrants to the islands used the Earth's heat for dressing slaughtered poultry and swine and steam-cooking rice and root crops. With the arrival of occidental cultures, spas were built for health and recreational purposes. Modern uses of geothermal heat are directed towards agricultural-industrial applications and electrical power generation.

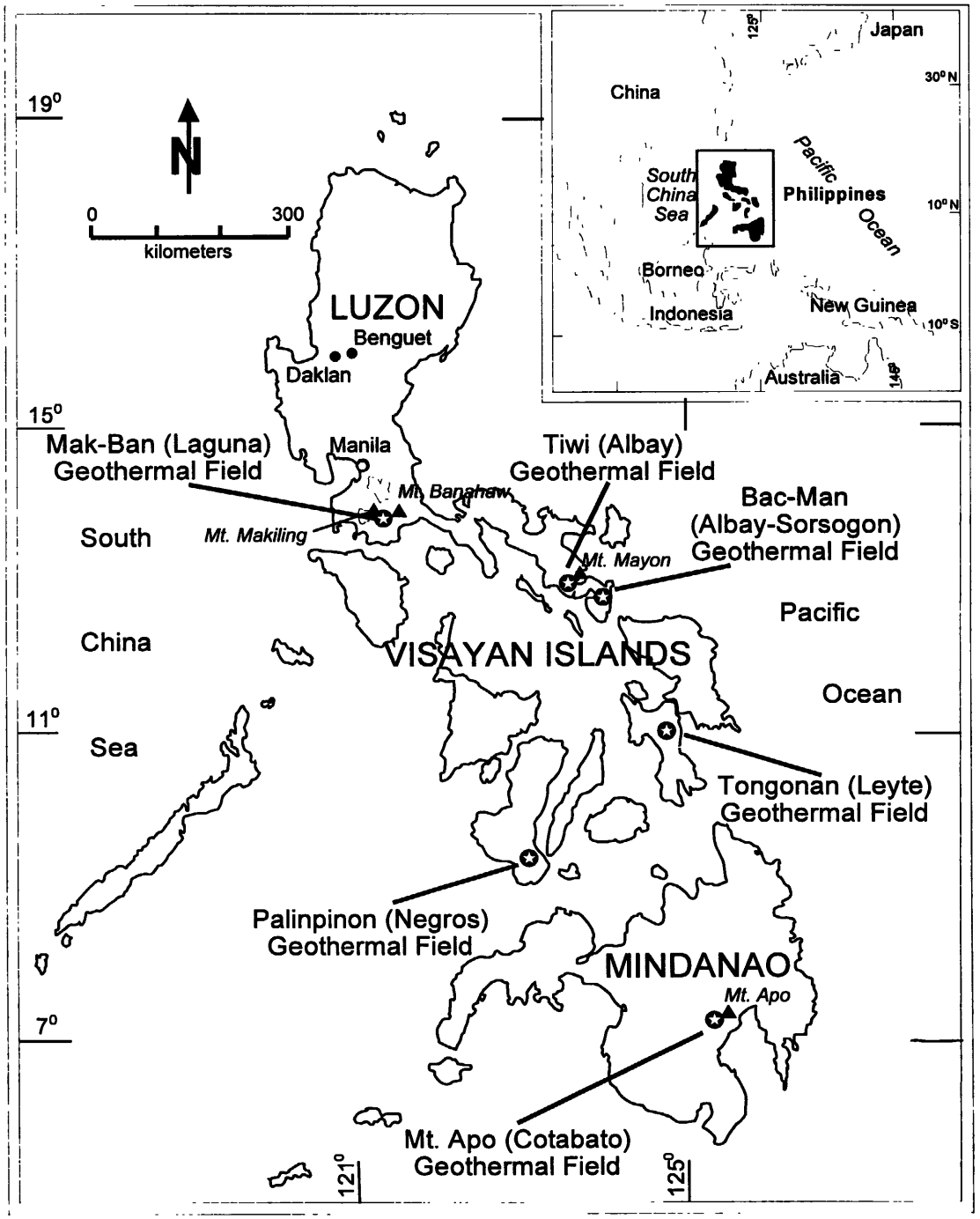
To improve the socioeconomic well-being of indigenous cultural communities, the Philippine government has taken steps to resolve concerns about geothermal development in their areas. Consultation with indigenous peoples and the payment of geothermal royalties in recognition of their rights over their ancestral lands will ensure fulfillment of the energy development objective.

Prologue

The Philippine archipelago consists of about 7,100 islands and islets on the western margin of the Pacific Ocean. The two largest islands of Luzon and Mindanao, with land areas of 105,000 and 95,000 square kilometers, respectively, represent two-thirds of the total land area of the Philippines, which has about 67 million people. The combined land and water area is about 1,800,000 square kilometers, with five times as much water as land. For comparison, the Philippines is about the size of Italy, slightly larger than the United Kingdom, and slightly smaller than Japan.

Since its entry two decades ago into the geothermal energy community, the Philippines has managed to develop its geothermal resources from almost nothing to its position today as the second largest producer of geothermal electrical power in the world. The present installed generating capacity of 1,948 megawatts supplies 16 percent of the nation's electrical power

needs. On the large islands of Leyte and Negros, geothermal energy is almost the only source of electrical power generation. With such large scale use of geothermal energy in the Philippines, the authors sought to learn if the early Filipinos also used the Earth's heat, which is so abundant in their lands.



Map for sites mentioned in the text, including geothermal fields.

Earth's Heat Awareness by Early Filipinos

Descendants of the early Filipinos, the people who inhabited the Philippines before the migration waves from nearby lands began, are found along the length and breadth of the archipelago. Collectively, their settlements are now referred to as indigenous cultural communities. According to the Indigenous People Desk of the Department of Environment and Natural Resources, 110 ethno-linguistic groups exist in the Philippines, comprising about 12 million people. These communities have their own languages and cultures, which set them apart from the present-day mainstream Filipinos of Malayan, Oriental, and Western descent. Since they live mostly in upland areas of the country, they are known as the highlanders, as opposed to the lowlanders, those living in cities, towns, and other urban centers.

In trying to determine whether or not the early Filipinos were aware of terrestrial heat and how they used it, it was necessary to delve into the rich cultures and languages of the indigenous cultural communities. Our studies indicate a paucity of written information referring directly to the Earth's heat. Perhaps this is because written information is unavailable, due to the unfortunate circumstances of illiteracy, displacement from ancestral lands, the nomadic lives of indigenous peoples, and the rapid social changes that erode folk traditions (Manuel, 1985; Togon, 1995). Any reference to fire or heat is usually associated with volcanoes, which early Filipinos revered as homes for their gods and symbols of fair maidens in myths and legends. Many of these stories have been passed orally from generation to generation and now are found in the few books of Philippine mythology.

On the Origin of the Philippine Archipelago

Two schools of thought exist on how the Philippine archipelago came into being. One group subscribes to the idea that the Philippines was once a part of mainland Asia through a land bridge, since submerged. The other group maintains that the archipelago was formed largely through magmatic activity from the ocean floor that produced volcanic islands, some of which eventually coalesced into larger land masses. Each idea has geologic evidence behind it, and perhaps both are correct and can be unified into a plausible whole.

It is interesting to note, however, that most legends of why the Philippines has so many islands do not mention volcanism as the cause, but rather gigantic battles between the sea and sky, with

the latter raining rocks on the former to become the islands (Jocano, 1969). Today, the Philippine archipelago has three major geographical units—Luzon, Visayas, and Mindanao—and the myth that follows offers a second idea of how the country was broken into many islands.

Long ago, when the Philippines was not yet divided into small islands but was one wide, solid island extending to the tip of northern Borneo, there lived in the Ilocos region of Luzon two huge beings, Angalo and Angarab. The husband and wife were so big that when they walked, the entire island shook. One day Angalo and Angarab went to gather clams at the southern end of the island, which was now in the Sulu Sea. When they opened the clams to eat the meat, they found sparkling stones and pearls inside. The luster of the pebbles caught the fancy of the couple, and they gathered more clams and removed the brilliant stones. After they had collected a considerable number, they started home.

Upon arriving at the middle of the island, a question arose: who should have the most glittering stones and pearls? The question started a quarrel that ended in a fight, with the two stamping their big feet and shouting at each other. The pressure from the heavy steps and the vibrations from the angry shouts caused mountains and hills to crumble, and the land was leveled and cracked. Once the fight got serious, big pieces of land went flying in all directions, becoming the islands of Luzon and Mindanao. The scene of the fight itself was horribly smashed, and the pieces became the Visayan Islands.

On Gods and Deities of Ancient Filipinos

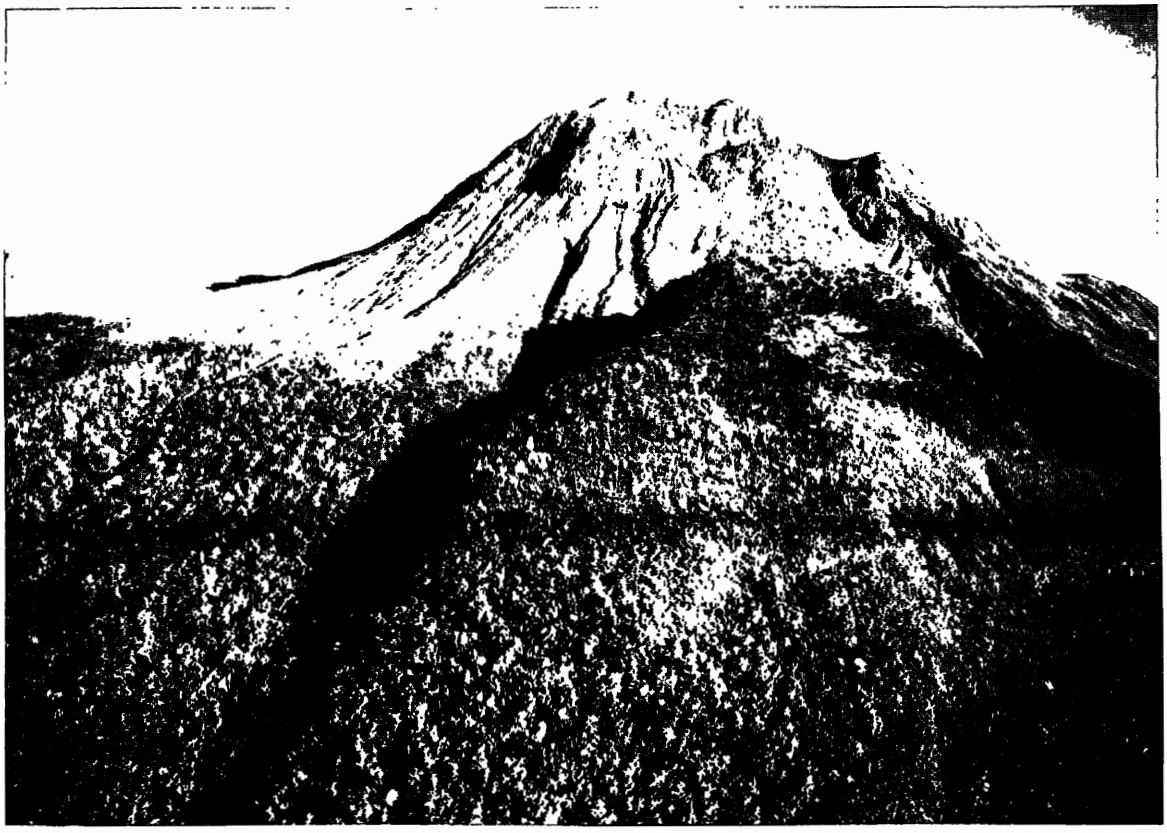
Explanations of how things began were exceedingly diverse among the early Filipinos, according to Professor F. L. Jocano of the Centro Escolar University Research and Development Center, for these people lived as independent groups and developed distinct customs and traditions. However, all early Filipinos shared common responses of awe and fear to unexplainable natural occurrences. They believed that mysterious natural phenomena were caused by the struggle of powerful, intelligent beings with human traits and qualities, a concept that molded their thoughts and the creation of their gods.

Bathala is the highest deity of the indigenous cultural communities of Luzon. It is said that his coming was heralded by flood, fire, and violent earthquakes. Surprisingly, these are the same natural calamities that afflict the Philippines due to its particular geographical position in the

Pacific: typhoons and hurricanes bring floods, and geological circumstances cause volcanic eruptions and earthquakes.

Bathala exacted obedience and reverence from those who believed in him, but he was also just and merciful. The ancient Filipinos learned to rely on his benevolence, and perhaps from this outlook came the *bahala na*, or "leave it to God" philosophy of life of the Filipinos.

The indigenous cultural communities of Mindanao regard as their supreme deity a spirit called Apo Sandawa. Mindanao tribesmen are animists and thus believe in the power of spirits. According to them, Apo Sandawa resides on Mount Apo, the highest volcano on the island of Mindanao, and from there oversees the welfare and lives of the indigenous tribes living around the mountain. M. Bernard writes that people who live near the slope call it *Apo*, meaning lord ("superior and powerful") and ancient ancestor, or "grandfather of the mountains" (Bernard, 1985). To the other tribes, Apo was a dreaded mountain, the home of Mandarangan, god of the fire, who dwelt upon a throne of fire, always thirsting for human blood. When calamity threatened or occurred, human offerings were made to Mandarangan. The human offerings



Summit of Mount Apo, 2,954 feet (909 m) high. This tallest of Philippine volcanoes holds court over Southern Mindanao and is considered sacred by a dozen indigenous cultural communities.

communicate with other gods, and the ceremony was undertaken to secure a good harvest, victory over the enemy, or cure of an illness (Gloria, 1987). This practice has disappeared, but offerings of food, money, and tobacco still are made (Togon, 1995; Bernard, 1985).

By 1983, geological exploratory efforts uncovered a potential geothermal resource in the area of Mount Apo. Before it could be developed, the worship of the mountain god by the indigenous cultural groups of Mindanao had to be addressed. The fears and concerns of the groups were given due consideration and response before the country began developing the geothermal resources in 1992.

On Volcanoes and Fair Maidens

No mountain god, however, had to be appeased before developing the Makiling-Banahaw Geothermal Field south of Manila, the capital of the Philippines. Legend says that Mount Makiling, the volcano on whose flanks the energy resource is located, is the home—not of a god—but of a beautiful enchantress named Maria Makiling.

Maria Makiling was not a creature of flesh and blood but a nymph with a heart of gold. She helped the needy, showering them with love and kindness. But Maria, spirit that she was, fell in love with a mortal, a handsome young farmer named Ban-aw who lived on a nearby volcano. Although Maria helped Ban-aw to become prosperous, he decided to marry a village lass.

On the eve of his wedding, Maria went to Ban-aw and told him of her love. Ban-aw promised her that if she would give him a basketful of gold for his bride-to-be, he would break his engagement and join Maria Makiling, instead. Maria gave him the gold.

Maria waited and waited for Ban-aw to return, but he never did. One day the villagers saw Maria no more, but for many years, they would hear her calling the name of Ban-aw, and each time after her wails and cries were heard, a storm would come. The volcano where Ban-aw, the faithless mortal, went to live now is called Banahaw. Thus the geothermal area developed between the two volcanoes is named the Makiling-Banahaw, or Mak-Ban Geothermal Field.

A similar story concerns Mayon volcano in Albay province of Luzon, regarded as a premier tourist attraction because of its perfect cone and grandeur. The volcano also provides a beautiful

Mount Makiling, taken from the west and overlooking sugar cane fields. *B. J. Barker*

Mount Banahaw, home of the faithless mortal, rises in the distance. The Mak-Ban Geothermal Field is in the valley, close to Mt. Bulalo where the photo was taken. *B. J. Barker*

background for Tiwi and Bacon-Manito geothermal power plants. A popular legend of Mount Mayon concerns a chieftain's daughter who was so pretty that people called her *Magayon*, meaning "beautiful." As fate would have it, she fell in love with one of her father's soldiers who was not of noble birth. This displeased her father; he preferred that she marry Maraut, the son of another chieftain.

Majestic Mayon volcano of Albay, Philippines. In the foreground are the Bacon-Manito Geothermal Field and the cooling towers of the geothermal power plant.

Magayon and her soldier-lover decided to elope. However, Maraut overheard their plans and informed Magayon's father. Enraged, he sent his henchmen to chase the eloping pair. The pursuers killed the young man with an arrow, while Magayon ran into a nest of poisonous snakes and died from their bites.

The grieving father buried his daughter on the spot where she died and a strange thing happened that night. A storm arose suddenly with thunder and lightning. When morning came, the mound on top of Magayon's grave had grown higher, into a perfect cone, which the people called Mayon, in memory of Magayon, the unfortunate maiden in love.

Two more mentions were found of how ancient peoples used terrestrial heat. One concerns a mixture of oil and bits of sulfur-rich rocks, known locally as *dawa*. *Dawa* is believed to be

medicinal, and its use was surrounded with mysticism (Gloria, 1987; Payne, 1985). In addition, the Earth's heat helped early Filipinos to make pottery, as some rocks were altered hydrothermally into potting clay. But most geothermal legacies left by early Filipinos were intangible, auras of romanticism surrounding volcanic areas and tales of volcanoes as homes for the gods.

Later Migrants

Information from the annals of later migrants in the geopolitical history of the islands makes mention of some other uses of the Earth's heat. Among these were (and still are) using hot springs for dressing slaughtered poultry and swine and for steam-cooking rice and root crops. When migrants from occidental cultures arrived, spas were built for health and recreational purposes.

There are examples of modern uses of the Earth's heat for nonelectrical purposes. A one-megawatt thermal plant for agricultural and industrial applications, commissioned in 1994, was built as an adjunct to the geothermal development in Palinpinon Geothermal Field on Negros island. A 0.75 megawatt geothermal plant began operating in 1998 in Manito, Albay, also for agricultural and industrial purposes.

Aids for Locating Geothermal Prospects

Unknowingly, past generations of Filipinos provided clues for locating geothermal prospects. These were the geothermal names given to localities or geographic features connected with terrestrial heat, such as *Mainit* ("hot"), *Los Baños* ("the baths"), *Magaso* ("steaming"), *Putinglupa* ("altered ground or kaolin"), *Cagua* ("kettle"), *Aslum* ("bitter"), and *Azufre* ("sulfur").

Exploratory help from indigenous cultural groups came in another form. Much of the interior of the Philippines has not been mapped in detail, and hot springs and other thermal manifestations are often in difficult, rugged terrain. Thus the information and physical guidance furnished by indigenous cultural groups have helped locate geothermal prospects.

Contact with tribal members in indigenous cultural communities and use of some as guides facilitated the entry of field exploration parties into places of tribal domain. Contact also served to introduce these groups to uses of the Earth's heat, and consultation with tribal elders of the immediate area usually preceded any exploratory activity.

Winning over Indigenous Cultural Communities

The development of Philippine geothermal resources has encountered stiff opposition in areas dominated by indigenous cultural communities, who have focused on legal, environmental, and cultural issues. The Mindanao I Geothermal Project on Mount Apo was one of the more controversial developments in this regard. Ote and de Jesus (1995) discuss the efforts undertaken by the governmental developer to resolve these concerns through a series of initiatives, transforming the project into one that is legally, environmentally, and socially acceptable.

Not only were the legal and environmental issues solved but so were the cultural issues, which were paramount if the project was to proceed. The tribal groups around Mount Apo regarded the volcano as the abode of their mountain god, Apo Sandawa. They held that any development on the volcano's slopes would be a desecration of holy ground. However, consultations with legitimate tribal leaders within and outside the project site and visits by the leaders to existing geothermal projects in 1990 convinced them of beneficial effects the undertaking would bring their communities.

In recognition of tribal rights and at the request of the tribes, the project developer endorsed the enactment of an ancestral domain law and contracted to pay the tribes one centavo (US $.00038) per kilowatt-hour of electrical generation, as royalty for using ancestral lands. Upon recommendation by the tribes within the project site, propitiatory rites and ceremonies, called *pamaas* in the local Manobo dialect, were held to seal the agreement. The *pamaas* were led by a tribal leader to seek approval for the project from the mountain god, Apo Sandawa. Amidst prayer chants and tribal music, sacrificial food in the form of meat from seven white animals was partaken of by all those involved in the project.

The rituals were reminiscent of the ceremony performed by the Igorots, an indigenous cultural group of the Cordilleras in Luzon, when the tribe granted permission to drill exploratory geothermal wells in Daklan, Benguet, in the 1980s. The rite, called *cañao*, was held to appease the

Propitiatory rites and ceremonies, called *pamaas*, are performed by the Manobos, an indigenous cultural community, together with PNOC-EDC officials, to seek approval from the mountain god, Apo Sandawa, for a geothermal project to be built on the slopes of his dwelling place, Mount Apo.

spirits dwelling in that area and those whose burial grounds are near the project site. The participating parties were dressed in tribal clothes, feasted on sacrificial food especially prepared for the occasion, and danced to native chants of prayers.

Epilogue

The Earth's heat appears to have played only a small role in the lives of the early inhabitants of the Philippines. Today that role is changing. Electricity generated from geothermal resources will reach the indigenous cultural communities, which have long awaited the benefits of modern civilization. The royalties that the tribes receive from developers who generate electricity

on their ancestral lands will be ample to improve their socioeconomic well-being, including expanding their arts and crafts. Then they can raise praises and thanks to their mountain gods for having lavishly endowed their lands with the Earth's heat, whose development has indeed proven a boon, both to themselves and to the energy self-reliance program of the Philippine nation.

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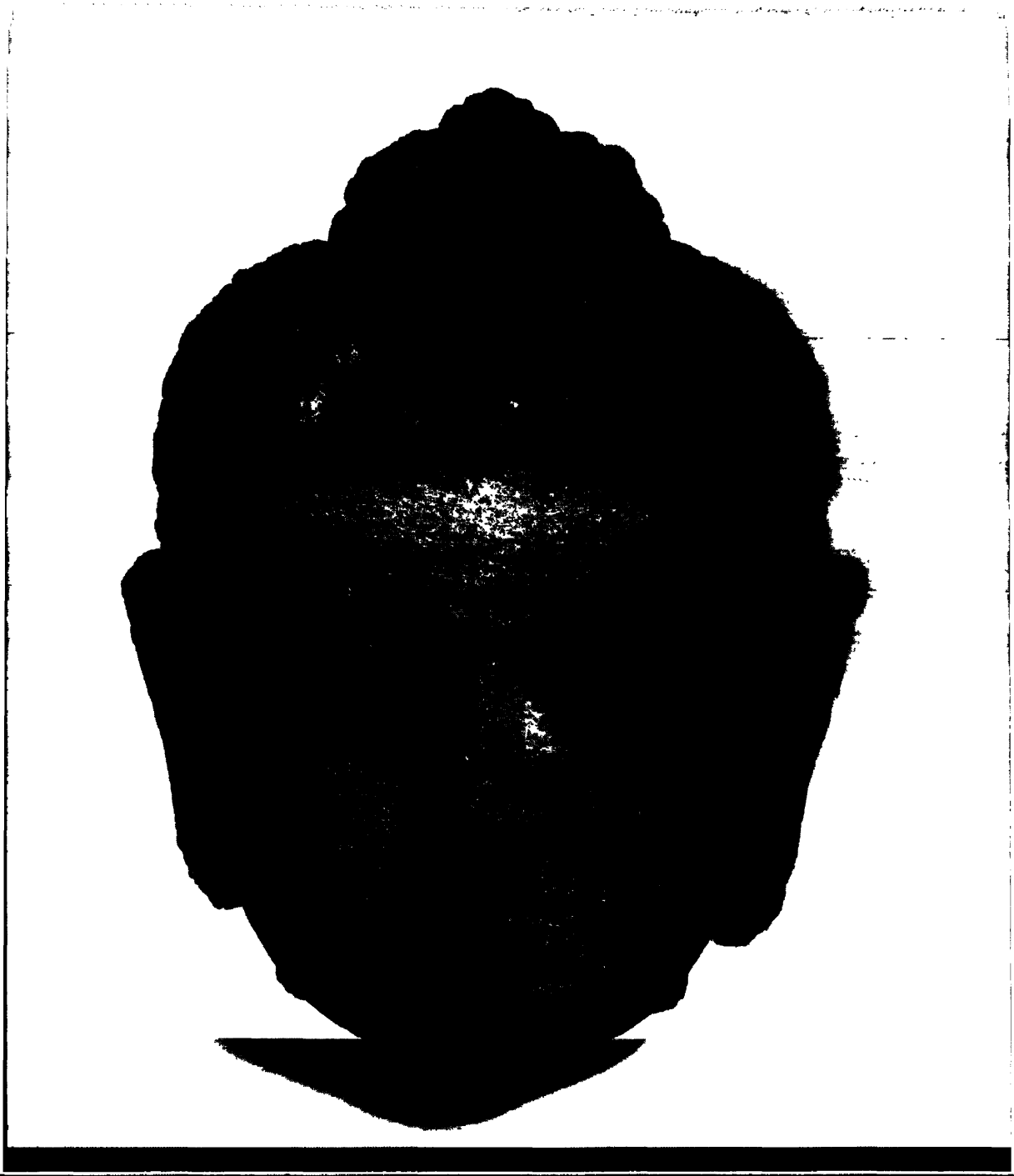

Head of a Dhyani Buddha, volcanic stone, Shailendra Dynasty, c. 800 A.D., Java, Indonesia. This dynasty built the Borobudur and the statue may be from the Borobudur itself. The texture of the volcanic stone contributes to the soft blurring of the facial features and the tightly-wound curls contrast strongly against the smooth, soft planes of the face. Height, 12 ½ inches; width, 10 inches; depth, 9 inches. *Asian Art Museum of San Francisco, The Avery Brundage Collection, B60S379*