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## Auroras and Early Modern Japanese Society: Responses to and Perceptions of the “Red Vapor” in 1770 Shrines’ Annual Events : Seasonal Celebration Rites

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# Auroras and Early Modern Japanese Society: Responses to and Perceptions of the “Red Vapor” in 1770<sup>1</sup>

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**Keywords:** low-latitude aurora (*teiido ōrora* 低緯度オーロラ), red vapor (*sekki* 赤気), astronomical perceptions (*tenmon ninshiki* 天文認識), Tsuchimikado Yasukuni 土御門泰邦, Kada no Nobusato 荷田信郷, Yanagiwara Norimitsu (Motomitsu) 柳原紀光

## *Author's Statement*

Based on the observation records of the aurora borealis (“red vapor”) on the night of the twenty-eighth day of the seventh month of Meiwa 明和 7 (17 September 1770), this paper clarifies how people in Japan during the Edo 江戸 period (1603–1868) perceived this extremely rare astronomical phenomenon.

## *Introduction*

This paper introduces historical sources documenting the “red vapor” (*sekki* 赤気), or low-latitude aurora, observed across Japan on the twenty-eighth day of the seventh month of Meiwa 明和 7 (1770). It explores how people in the early modern period perceived and responded to this extremely rare astronomical phenomenon.

Today in Japan, auroras can only be observed in limited parts of Hokkaido. However, historical sources confirm that auroras were visible across Japan before the modern period. Typically, auroras are thought of as green lights, but an aurora's light has two layers: red in the upper layer and green in the lower layer. In low-latitude regions like Japan, the green lower portion is obscured by the horizon, causing the aurora to appear red. Consequently, it was often recorded as “red vapor.”

<sup>1</sup> This article is a translation of Iwahashi Kiyomi 岩橋清美, “‘Sekki’ to kinse shakai: Meiwa shichinen no ‘sekki’ wo meguru hitobito no taiō to ninshiki” 「赤気」と近世社会—明和七年の「赤気」をめぐる人々の対応と認識, *Kokugakuin zasshi* 國學院雑誌 123: 2 (2022), pp.1–21. Translated by Dylan L. Toda.

The oldest record of “red vapor” in Japan appears in the *Nihon shoki* 日本書紀, describing an incident on the first day of the twelfth month of Suiko 推古 28 (620). The text states that a light resembling a pheasant’s tail was visible in the northern sky.<sup>2</sup> Other well-known records include the entries for the nineteenth and twenty-first days of the first month of Kennin 建仁 4 (1204) in the *Meigetsuki* 明月記.<sup>3</sup> Scholars have identified auroras as occurring in the Edo 江戸 period (1603–1868) on the twenty-sixth day of the seventh month of Kan’ei 寛永 12 (7 September 1635), the twenty-eighth day of the twelfth month of Kyōhō 享保 14 (15 February 1730), the twenty-eighth and twenty-ninth days of the seventh month of Meiwa 7 (17 September and 18 September 1770), and the sixth day of the eighth month of Ansei 安政 6 (2 September 1859).<sup>4</sup> Among these, the aurora of Ansei 6 (1859) was caused by the first and most intense Carrington Flare in the history of modern observation.<sup>5</sup> This paper focuses on Meiwa 7, for which the most historical sources remain.

In the field of Japanese early modern history, red vapor has received almost no attention compared to celestial phenomena like solar and lunar eclipses or comets. This lack of focus can be attributed to the fact that most scholars have not known about the occurrence of auroras in Edo-period Japan and did not realize that the term *sekki* refers to auroras.

However, in the history of astronomy, historical records of low-latitude auroras have attracted attention from before World War II, with contributions from researchers such as Kanda Shigeru 神田茂, Ōsaki Shōji 大崎正次, and Watanabe Yoshikazu 渡邊美和. Nevertheless, these studies primarily focused on the collection of historical sources.<sup>6</sup> Nakazawa Yō’s 中沢陽 research that scientifically analyzed historical records was pioneering,<sup>7</sup> but systematic studies began only in 2010, as interdisciplinary collaborations between researchers in the humanities and sciences gained momentum.<sup>8</sup>

The focus on historical sources within solar physics stems from a pressing modern issue: massive geomagnetic storms have the potential to damage satellites and large power grids. Addressing this issue requires long-term data on solar activity. Consequently, early research primarily involved historians providing highly accurate and reliable sources to solar physicists. However, as research progressed, it became clear that numerous

<sup>2</sup> Kuroita, *Shintei zōho kokushi taikai Nihon shoki*, p. 159.

<sup>3</sup> Fujiwara, *Meigetsuki* 1, pp. 511–512.

<sup>4</sup> Iwahashi and Kataoka, *Ōra no Nihonshi*, p. 40.

<sup>5</sup> Hayakawa et al., “East Asian observations.”

<sup>6</sup> Kanda, *Nihon tenmon shiryō*; Ōsaki, *Kinsei Nihon tenmon shiryō*; Watanabe, *Zoku Kinsei Nihon tenmon shiryō*.

<sup>7</sup> Nakazawa et al., “Understanding the ‘SEKKI’ phenomena.”

<sup>8</sup> Interdisciplinary research findings on the Meiwa 7 aurora include Kataoka et al., “Inclined Zenith Aurora over Kyoto on 17 September 1770”; Hayakawa et al., “Long-lasting Extreme Magnetic Storm”; and Ebihara et al., “Possible Cause of Extremely Bright Aurora.”

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terms and expressions were referring to auroras. The term *sekki*, previously commonly thought to exclusively denote auroras, was also found to describe comets and various optical atmospheric phenomena, such as aerosols. This realization highlighted the need for historians to carefully examine sources to establish facts. Furthermore, another task remained: connecting results derived from solar physics methodologies with historical themes such as societal responses and perceptions. The bidirectional integration of the humanities and sciences is essential for advancing future research.<sup>9</sup>

This paper builds on these earlier studies, returning to a historical perspective to examine how the phenomenon of red vapor was described and perceived in early modern society.

In medieval history, astronomical phenomena have often been discussed in relation to the emperor's authority. Kuroda Hideo 黒田日出男 has demonstrated how ominous celestial events, such as solar and lunar eclipses, led to efforts to protect the emperor's body from their mysterious lights by “encasing” (*tsutsumu* 裹む) the imperial palace (*gosho* 御所) and conducting sutra readings, such as recitations of the *Prajñāpāramitā Sūtra* (*Hannya-kyō* 般若經).<sup>10</sup> Also, it has been argued that under the view that heaven communicates its will to the emperor through celestial events (*tenjin sōkan* 天人相関), people believed that such events and geological abnormalities were divine punishment to correct the emperor's lack of virtue as a ruler (*tenken* 天譴).<sup>11</sup> In early modern society, the latter belief widely gave rise to a political consciousness holding that those events and abnormalities were reflections of the poor governance of rulers who had been entrusted with power by heaven to govern benevolently.<sup>12</sup>

Sugi Takeshi 杉岳志 analyzed comets to clarify how shoguns, the imperial court, and the populace perceived divine punishment. He examined the shoguns Ietsuna 家綱, Tsunayoshi 綱吉, and Yoshimune 吉宗, finding that Tsunayoshi's perceptions were influenced by such a view, whereas Yoshimune viewed comets as natural phenomena. This demonstrated the potential of discussing shogunal authority from the vantage point of celestial perceptions.<sup>13</sup> Sugi also noted that the people's interpretation of comets

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<sup>9</sup> Examples of interdisciplinary research include Hayakawa et al., “East Asian observations” and Isobe et al., “Kinsei shiryō ni miru ōrora to hitobito no ninshiki.” The latter article paper focuses on the “red vapor” recorded by Yanagiwara Norimitsu (Motomitsu) 柳原紀光 in *Zokushi gushō* 続史愚抄 and *Gushin* 愚紳 on the twenty-ninth day of the seventh month of Meiwa 7. The authors highlight discrepancies between the descriptions in these texts and use a solar physics approach to reconstruct the aurora of that date. Their analysis demonstrates that Yanagiwara accurately captured the intensity of the aurora's brightness. This interdisciplinary study exemplifies how findings from solar physics can validate historical records of celestial phenomena that traditional historical analysis alone might not fully confirm.

<sup>10</sup> Kuroda, *Ō noshintai, ō no shōzō*, pp. 34–35.

<sup>11</sup> Wakao, “Tenpen chii no shisō.”

<sup>12</sup> Wakao, “*Taiheiki-yomi*” no jidai.

<sup>13</sup> Sugi, “Tokugawa shōgun to tenpen.”

depended heavily on societal conditions. When anxiety was widespread, comets were seen as ill omens. Conversely, during times of stability, they were viewed as auspicious signs.<sup>14</sup> These findings are also instructive for considering perceptions of auroras. However, auroras, exceptionally rare astronomical phenomena, pose distinct challenges for historical analysis. Examples from different periods are not readily comparable. Additionally, auroras are absent from astronomical texts such as *Tianjing huowen* 天經或問 (Jp. *Tenkei wakumon*). Even individuals with astronomical knowledge did not readily recognize or explain “red vapor” as an astronomical phenomenon.

This paper begins by providing an overview of the distinctive qualities of sources describing the red vapor. It then analyzes responses to and perceptions of auroras among the court nobility, intellectuals, peasants, and townspeople. By examining the relationship between how events were recorded and social hierarchies, this study aims to clarify how auroras were understood in early modern society and explore their connection to astronomical perceptions in the late eighteenth century.

### **1. Records Concerning the Red Vapor**

This section examines the records of the red vapor observed on the twenty-eighth day of the seventh month of Meiwa 7. It outlines the observation sites, recorders (observers), and vocabulary used to describe the aurora, providing a foundation for my later discussion.

#### **(1) Observation Sites and Recorders**

**Table 1** summarizes the observation sites and recorders (observers) for the sixty-four records of the red vapor on the twenty-eighth day of the seventh month of Meiwa 7. According to these records, it was visible across nearly the entire expanse of Japan, from Hokkaido to Kyushu. Additionally, it was observed over Dongting 洞庭 Lake in northeastern Hunan Province, China. This suggests the possibility of a geomagnetic storm larger than the Carrington Event, considered the largest in observational history.<sup>15</sup>

The recorders came from various social strata, including the warrior class, court nobles, townspeople, and peasants. The records include historical chronicles, annals, timelines, a biography, a topography, astronomical texts, diaries, and essays. Diaries are the most prevalent, followed by annals and essays. Many records of the red vapor appear in the diaries of court nobles and Kyoto’s temples and shrines. This trend reflects the fact that, as seen in the descriptions of solar and lunar eclipses and comets, astronomical phenomena were often linked to decisions regarding the emperor’s physicality, such as whether to hold

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<sup>14</sup> Sugi, “Shoseki to fōkuroa.”

<sup>15</sup> Hayakawa et al., “Long-lasting Extreme Magnetic Storm.”

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**Table 1. List of Historical Sources Menioning the Red Air of Meiwa 7**

Source Type	Source Title (Romaji)	Source Title (Japanese Characters)	Source Author (Romaji)	Source Author (Japanese Characters)	Author's Social Status/ Occupation	Source/Holding Institution
History Book	Zokushi gushō	続史愚抄	Yanagiwara Norimitsu (Motomitsu)	柳原紀光	Court Noble	Kuroita Katsumi 黒板勝美 and Kokushi Taikēi Hensankai 国史大系編纂会, eds. <i>Shintei zōho kokushi taikēi 15: Zokushigushō</i> 新訂増補国史大系15 続史愚抄. Yoshikawa Kōbunkan, 1966.
History Book	Zoku kōnendai ryakki	続皇年代略記	Ono Takakiyo	小野高潔	Warrior Class	Kokuritsu Kōbunshokan 国立公文書館.
History Book	Taihei nenpyō	泰平年表	Ōno Hiroki	大野広城	Warrior Class	Waseda Daigaku Toshokan 早稲田大学図書館.
History Book	Zoku Nihon Ōdai Ichiran ?	続日本王代一覧	Katayama Enzen	片山円然	—	Kokuritsu Kōbunshokan.
History Book	Zokudankai	続談海	—	—	—	<i>Naikaku Bunko shozō shiryō sōkan</i> 内閣文庫所蔵史料叢刊, vols. 45 and 46. Kyūko Shoin, 1985.
Annal	Inpakuzakki	因伯雑記	Okamoto Masayoshi (Tottori 鳥取 domain retainer)	岡本正義	Warrior Class	Tottori Kenritsu Hakubutsukan 鳥取県立博物館.
Annal	Nennen chinjiki	年々珍事記	—	—	(Shōya 庄屋 Village Official)	<i>Sakuraishishi shiryōhen geben</i> 桜井市史史料編下編. Nara-ken Sakurai-shi, 1981.
Annal	(Tase-mura shoji tomegaki-chō)	(田瀬村諸事留書帳)	(Tase Shōya Village Official)	—	(Shōya Village Official)	<i>Fukuokachōshi shiryōhen gekan</i> 福岡町史史料編下巻. Gifu-ken Ena-gun Fukuoka-chō, 1983.
Annal	Kenbunroku	見聞録	—	—	Shōya Village Official	<i>Hirakatahashi dai 9-kan shiryō 4</i> 枚方市史第9巻 史料4. Ōsaka-fu Hirakata-shi, 1974.
Annal	Eitai kakoroku	永代過去録	Tokuzenji	徳善寺	Buddhist Monk	<i>Suitashishi dai 6-kan</i> 吹田市史 第6巻. Ōsaka-fu Suita-shi, 1974.
Annal	Senpukuji shojikenbun zakki	専福寺諸事見聞雑記	Senpukuji	専福寺	Buddhist Monk	<i>Shishi sōsho 24: Senpukuji shoji kenbunki</i> 市史双書 24 専福寺諸事見聞記. Niigata-ken Nagaoka-shi, 1993.
Annal	Ōhira nendaiki	大平年代記	Kataoka Tanejirō (copyist)	片岡種次郎	Peasant	<i>Ōhiramura kokiroku</i> 大平村古記録. Shizuoka-ken Numazu-shi Kyōiku linkai, 2000.
Annal	Yorozu mezurashikikoto oboechō	万珍敷事覚帳	—	—	(Village Official)	<i>Tawaramotochōshi shiryōhen dai 1-kan</i> 田原本町史 史料編第1巻. Nara-ken Tawaramoto-chō, 1988.
Annal	Kokon kikkyō narabi kokoroe kichō	古今吉凶並心得記帳	Okada Taheiji	岡田大平治	(Village Official)	<i>Andochōshi</i> 安堵町史. Nara-ken Ikoma-gun Ando-chō, 1991.
Annal	Aramaki-mura miyaza nakama nendaiki	荒蒔村宮座中間年代記	Aramaki-mura miyazatōya	荒蒔村宮座頭屋	Peasant	<i>Kaitei Tenrishishi shiryōhen dai 1-kan</i> 改訂天理市史 史料編第1巻. Nara-ken Tenri-shi, 1977.
Annal	Kawachi-shi kiroku	河内氏記録	Kawachi Family	河内氏	Shōya Village Official	<i>Nakajōmachishi shiryōhen dai 3-kan kinsei ge</i> 中条町史 資料編第3巻 近世下. Niigata-ken Kitakanbara-gun Nakajō-machi, 1985.
Annal	Seken kikigaki oboe ichi	せ間聞書覚 一	Uematsu Yoemon	植松與右衛門	(Village Official)	<i>Harajuku Uematsuke nikki kenbun zakki</i> 原宿植松家日記・見聞雑記. Shizuoka-ken Numazu-shi, 1995.
Annal	Ryūnenji ruki	龍拈寺留記	Ryūnenji	龍拈寺	Buddhist Monk	Kondō Tsuneji 近藤恒次, ed. <i>Mikawa bunken shūsei kinseihen jō</i> 三河文献集成 近世編上. Aichi-ken Hoi Chihōshi Hensaninkai, 1963.
Annal	Ōtake-san Kōfukuji jūji oboegaki	大嶽山興福寺住持覚書	Kōfukuji	興福寺	Buddhist Monk	<i>Minamikatachōshi shiryōhen</i> 南方町史 資料編. Miyagi-ken Minamikata-chō, 1975.
Annal	(Nendaiki)	(年代記)	Kikuchi Family	菊地氏	(Village Official)	<i>Shirasawasonshi</i> 白沢村史. Fukushima-ken Shirasawa-mura, 1991.
Annal	(Nendaiki)	(年代記)	—	—	(Village Official)	<i>Ishinomaki no rekishi dai 9-kan shiryōhen 3 kinseihen</i> 石巻の歴史 第9巻 資料編 3 近世編. Miyagi-ken Ishinomaki-shi, 1990.
Annal	Nendai jitsuroku	年代実録	Yasuyama Shōgen (Miyakonojo Shimazu 都城島津 family retainer)	安山松厳	Warrior Class	<i>Nendaijitsuroku</i> 年代実録. Miyakonojō-shi Toshokan, 1974.

Source Type	Source Title (Romaji)	Source Title (Japanese Characters)	Source Author (Romaji)	Source Author (Japanese Characters)	Author's Social Status/ Occupation	Source/Holding Institution
Annal	Ruinen oboegaki shūyō	累年覚書集要	Yasufuku Gen'emom	安福源右衛門	( <i>Daishōya</i> 大庄屋 Village Official)	Miki Kyōdoshi no Kai 三木郷土史の会, ed. <i>Ruinen oboegaki shūyō: Akashihan Mikigun Ogawagumi Ōshōya Yasufukue shichidai no kiroku</i> 累年覚書集要—明石藩三木郡小川組大庄屋安福家七代の記録 一. Miki-shi Kyōiku Linkai, 1994.
Annal	Waga issō kenmonchi oboegaki	我一生見聞知覚書	Genzō	源蔵	( <i>Nanushi</i> 名主 Village Official)	<i>Yamatsurichōshi kenkyū</i> 矢祭町史研究 (2). Fukushima-ken Higashishirakawa-gun Yamatsuri-machi, 1979.
Annal	Taiunkō gonenu	泰雲公御年譜	Heki Ken	日置謙	—	<i>Kagaban shiryō dai 8-ben</i> 加賀藩史料 第8編. Seibundō Shuppan, 1980.
Annal	Kukuyaki	九々夜記	—	—	(Warrior Class)	Jōetsu-shiritsu Takada Toshokan shoō Sakakibara-ke monjo 上越市立高田図書館所蔵榊原家文書.
Annal	Yūrandō nenpushō	幽蘭堂年譜抄	Matano Gyokusen (Tatsuno 龍野 domain Confucianist)	股野玉川	Warrior Class	Takeshita Kikuo 竹下喜久男, ed. <i>Seibundō shiryō sōsho dai 72-kan: Banshū Tatsuo no han juka nikki Yūrandō nenroku 1</i> 清文堂史料叢書第72刊 播州龍野藩儒家日記 幽蘭堂年録 1. Seibundō Shuppan, 1995.
Timeline	Bukō nenpyō	武江年表	Saitō Gesshin	斎藤月岑	Edo Town Head	<i>Bukō nenpyō</i> 武江年表. Heibonsha, 1968.
Timeline	Sanjū nenpyō	三重年表	Nozoki Yoshimasa (Yonezawa 米沢 domain retainer)	佐戸善政	Warrior Class	<i>Yamagatakenshi shiryōhen 3</i> 山形縣史 史料編3. Yamagata-ken, 1979.
Biography	Uchiyama Matsuo ōden	内山真龍翁伝	Uchiyama Jihei Yoshiyuki	内山治兵衛美之	<i>Shōya</i> Village Official	<i>Tenryūshishi shiryōhen 6</i> 天竜市史 史料編6. Shizuoka-ken Tenryū-shi, 1979.
Topography	Echigo yashi	越後野志	Odajima Nobutake	小田島久武	Townsperson (Publisher)	Minagawa Kōshō 源川公章, ed. <i>Echigo Yashi jō</i> 越後野志 上. Rekishi Toshosha, 1974.
Diary	Inatsukake nikki	稲束家日記	Inatsuka Family	稲束	<i>Shōya</i> Village Official	<i>Ikedashishi shiryōhen 4</i> 池田市史 史料編4. Osaka-fu Ikeda-shi, 1980.
Diary	Mandaiki	万代記	Tadokoro Family	田所	<i>Daishōya</i> Village Official	<i>Kishū Tanabe Mandaiki dai 4-kan</i> 紀州田辺万代記 第4巻. Seibundō Shuppan, 1992.
Diary	Kiroku jūichi	記録 拾壹	Tsuda Seirin (Kanazawa 金沢 domain retainer)	津田政隣	Warrior Class	Takagi Kimiko 高木喜美子, ed. <i>Seirinki kiroku jūichi</i> 政隣記 記録拾壹. Katsura Shobō, 2015.
Diary	(Nikki shōroku)	(日記抄録)	Matsumae Hironaga (Matsumae 松前 domain retainer)	松前広長	Warrior Class	<i>Matsumaechōshi shiryōhen dai 1-kan</i> 松前町史 史料編第1巻. Hokkaidō Matsumae-gun Matsumae-chō, 1974.
Diary	Ozawa nikki	小沢日記	Ozawa Seizaemon/Denbee	小沢清左衛門・伝兵衛	(Village Official)	Wakisaka Toshio 脇坂俊夫, ed. <i>Murayakunin nikki—Tenryō to Mikusa hanryō</i> 村役人日記—天領と三草藩領 一. Shikaban, 1986.
Diary	Yorozu oboechō	萬覚帳	Genzō	源蔵	Nanushi Village Official	<i>Yamatsurichōshi kenkyū</i> 矢祭町史研究 (2). Fukushima-ken Higashishirakawa-gun Yamatsuri-machi, 1977.
Diary	Nikki	日記	—	—	(Village Official)	<i>Akitakenshi shiryō kinseihen jō</i> 秋田県史資料近世編 上. Akita-ken, 1963.
Diary	Nikki yon	日記 四	Motoori Norinaga	本居宣長	Kokugaku 国文学 scholar	Ōkubo Tadashi 大久保正, ed. <i>Motoori Norinaga zenshū dai 16-kan</i> 本居宣長全集 第16巻. Chikuma Shobō, 1974.
Diary	Zassho	雑書	Morioka-Han karō	盛岡藩家老	Warrior Class	<i>Moriokaban karōeki nikki zassho dai 27-kan</i> 盛岡藩 家老席日記 雑書 第27巻. Morioka-shi Kyōiku Linkai, 2011.
Diary	Kuni nikki	国日記	Hirosaki-han	弘前藩	Warrior Class	Hirosaki-shiritsu Hirosaki Toshokan 弘前市立弘前図書館.
Diary	Edo nikki	江戸日記	Hirosaki-han	弘前藩	Warrior Class	Hirosaki-shiritsu Hirosaki Toshokan.
Diary	Hitsugi	日次	Ichōshi	鴨脚氏	Kamo Mioya Jinja 賀茂御祖神社 Shrine Family	<i>Meiji Daigaku Hakubutsukan shozo Shimogamo Jinja monjo</i> 明治大学博物館所蔵下賀茂神社文書 (Ichōke monjo 鴨脚家文書).
Diary	Nikki	日記	Bettōsho	別当所	Shrine Priest	Kamowakeikazuchi Jinja 賀茂別雷神社.



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Source Type	Source Title (Romaji)	Source Title (Japanese Characters)	Source Author (Romaji)	Source Author (Japanese Characters)	Author's Social Status/ Occupation	Source/Holding Institution
Diary	Nichifu	日譜	Hakura Nobusato	羽倉信郷	Shrine Family	Deposited in the collection of the Kokugakuin Daigaku Toshokan 國學院大學圖書館 from the Higashihakurake Monjo 東羽倉家文書.
Diary	Kanoetora hitsugi	庚寅日次	Nakahashi Family	中橋氏	—	Nakahashike monjo 中橋家文書 in the collection of the Kokubungaku Kenkyū Shiryōkan 国文学研究資料館.
Diary	Hakkai gyoki	八槐御記	Hirohashi Kanetane	広橋兼胤	Court Noble (Liaison to the warrior class)	Kokuritsu Kōbunshokan.
Diary	Gushin	愚紳	Yanagiwara Norimitsu (Motomitsu)	柳原紀光	Court Noble	Kunai-chō Shoryōbu 宮内庁書陵部.
Diary	Nonomiya sadaharu nikki	野宮定晴日記	Nonomiya Sadaharu	野宮定晴	Court Noble	Kunai-chō Shoryōbu.
Diary	Yasukunikyōki	泰邦卿記	Tsuchimikado Yasukuni	土御門泰邦	Court Noble (on'yō no kami)	Kunai-chō Shoryōbu.
Astronomical Text	Honchō tenmonshi	本朝天文志	Nishimura Tōsato	西村遠里	Calendar specialist	Kokuritsu Kokkai Toshokan 国立国会図書館.
Astronomical Text	Seikai	星解	Juryōan Shūin	寿量庵秀尹	—	Matsusaka Shiyakusho 松阪市役所, Tōhoku Daigaku Fuzoku Toshokan 東北大学付属図書館, Hikone-shiritsu Toshokan 彦根市立図書館.
Essay	Nochi migusa	後見草	Sugita Genpaku	杉田玄白	Western-Style Physician	Kokuritsu Kōbunshokan.
Essay	Hannichi kanwa	半日閑話	Ōta Nanpo	大田南畝	Warrior Class	Hamada Giichirō 浜田義一郎, ed. <i>Ōta Nanpo zenshū dai 11-kan</i> 大田南畝全集 第11卷. Iwanami Shoten, 1988.
Essay	Oriorigusa	折々草	Takebe Ayatari	建部綾足	Kokugaku scholar, Haiku Poet	<i>Nihon zuibitsu taisei dai 2-ki 21-kan</i> 日本隨筆大成 第2期21卷. Yoshikawa Kōbunkan, 1974.
Essay	Setsuyō kikan	摂陽奇観	Hamamatsu Utakuni	浜松歌国	Kyōgen 狂言 Playwright	Funakoshi Seiichirō 船越政一郎, ed. <i>Naniwa sōsho dai 6-kan</i> 浪速叢書 第6卷. Naniwa Sōsho Kankōkai, 1929.
Essay	Kagomimi shū	籠耳集	Kusama Naokata	草間直方	Townsperson	Harada Tomohiko 原田伴彦 et al., eds. <i>Nihon toshi seikatsu shiryō shūsei dai 1-kan (Santo-ben 1)</i> 日本都市生活史料集成 第1卷(三都篇1). Gakushū Kenkyūsha, 1977.
Essay	Shōzan chomonshū (Chomonjū?)	想山著聞集	Miyoshi Shōzan (Owari 尾張 domain retainer)	三好想山	Warrior Class	Tanigawa Kenichi 谷川健一. <i>Nihon shomin seikatsu shiryō shūsei dai 16-kan: Kidan/Kibun</i> 日本庶民生活史料集成 第16卷 奇談・紀聞. San'itsu Shobō, 1970.
Essay	Enkōan zuikanzue	猿猴庵随観図絵	Kōriki Tanenobu (Owari domain retainer)	高力種信	Warrior Class	Kokuritsu Kokkai Toshokan.
Other	(Meiwa daikanbatuski)	(明和大旱魃記)	Owarinokuni Niwagun Inuyamamura Shinzaemon	尾張国丹羽郡犬山村新左衛門	Shōya Village Official	<i>Inuyamashishi shiryōben</i> 5 犬山市史 史料編5. Aichi-ken Inuyama-shi, 1990.
Other	Mitake wakamiya hachimansha saireichō	御嵩若宮八幡社祭礼帳	—	—	(Peasant)	<i>Mitakechōshi shiryōben</i> 御嵩町史 史料編. Gifu-ken Kani-gun Mitake-chō, 1987.
Other	Beikaki	米価記	Shibata Yoshinobu (Yoshida 吉田 domain retainer)	柴田善伸	Warrior Class	Kondō Tsuneji 近藤恒次, ed. <i>Mikawa bunko shūsei kinseihen ge</i> 三河文庫集成 近世編下. Aichi-ken Hoi Chihōshi Hensaniinkai, 1965.
Other	Ōmachi nenbutsukōchō	大町念仏講帳	Dewanokuni Nishimurayamagun Kahokuchō Ōmachi Nenbutsukō	出羽国西村山郡河北町大町念仏講	Peasant	<i>Ōmachi nenbutsu kōshaku: Kahoku chōshi hensan shiryō</i> 大町念仏講釈—河北町誌編纂史料. Yamagata-ken Nishimurayama-gun Kahoku-chō, 1991.
Other	Sakugara-hikae	作柄控	—	—	—	Takahashi Bonsen 高橋梵仙, ed. <i>Kinsei shakai keizai shiryō shūsei dai 4-kan</i> 近世社会経済史料集成 第4卷. Daitō Bunka Daigaku Tōyō Kenkyūjo, 1977.

“—” indicates that the information is unknown.

Unless surrounding a source title, information in parentheses has been inferred. Source titles in parenthese include titles given at time of municipal history compilation.



imperial court rituals or prayers.

Red vapor was rarely mentioned in daimyo family diaries, likely because weather observations themselves were uncommon. Since diaries in general typically noted astronomical events alongside weather, they too were seldom recorded. Furthermore, domain diaries were used to record the activities of the domain lord and developments within the domain or at his Edo residence, making daily weather records relatively unnecessary. Insofar as I am aware, the only domain diaries mentioning red vapor are those of the Hirosaki 弘前 Domain (the diaries for both its territory and Edo), as well as the diary of a senior retainer from the Morioka 盛岡 Domain. Neither the Edo shogunate's diaries nor records from its Office of Astronomy (Tenmongata 天文方) include entries about the event.

#### Source 1<sup>16</sup>

The twenty-ninth *mizunoto tori* 癸酉 day of the seventh month. Cloudy. [insect damage] At mid-morning in the hour of the snake, light rain. Last night, in the hour [insect damage] of the dog, red vapor rose in the northwest and around [insect damage] intensified. During the hour of the snake, in the north-northeastern sky [insect damage] there was a circular red hue, and by the hour of the rat, dozens of streaks of white vapor, like strips of cloth, appeared within the red vapor. By the hour of the ox, the red vapor dispersed east and west and faded away.

This excerpt from the Hirosaki Domain's territorial diary describes the weather on the day after the red vapor's appearance, followed by a detailed account of the atmospheric phenomenon from its emergence to its disappearance the previous night. The domain's Edo diary record for the twenty-eighth day notes: "After the hour of the ox, the northwest sky glowed red." In other words, the red vapor was observed in both Edo and Hirosaki. The detailed description in the former diary suggests that Hirosaki, located at a higher latitude, had a clearer view of the phenomenon than Edo.

The Hirosaki Domain's practice of recording daily weather in its domain diary is likely tied to its repeated experiences of natural disasters and resulting famine throughout the Edo period. A distinctive feature of these records is the detailed documentation of disaster and famine impacts, as well as the responses to them. The daily weather records probably reflect a concern for climatic changes that could lead to such disasters.

How are these phenomena recorded in annals and essays? Many annals were written by village officials, and their contents can be likened to "village historical records" (*mura-kata*

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<sup>16</sup> "Kuni nikki," entry for the twenty-ninth day of the seventh month of Meiwa 7.

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*kyūki* 村方旧記), documenting lawsuits, disasters, festivals, and other village events, along with the red vapor, which was recorded as a mysterious natural phenomenon. Other notable village records include materials related to local religious beliefs and practices, agricultural work, and disasters, such as the “Aramaki mura miyaza nakama nendaiki” 荒蒔村宮座中間年代記,<sup>17</sup> “Ōmachi nenbutsukōchō” 大町念仏講帳,<sup>18</sup> “Mitake wakamiya hachimansha saireichō” 御嵩若宮八幡社祭礼帳,<sup>19</sup> “Sakugara-hikae” 作柄控,<sup>20</sup> “Meiwa daikanbatsuki” 明和大旱魃記.<sup>21</sup>

Among these, the “Aramaki mura miyaza nakama nendaiki” is a record maintained by the shrine organization (*miyaza* 宮座) of Aramaki 荒蒔 Village in Yamabe 山辺 District, Yamato 大和 Province (present-day Tenri 天理 City, Nara Prefecture). The successive heads of the organization wrote entries each year.<sup>22</sup> The content includes records of events in the village and surrounding areas from Tenshō 天正 1 (1573) to Tenpō 天保 5 (1834). While the early entries up through the Keian 慶安 years (1648–1652) mainly list the names of each year’s organizational head, the entries diversify from the Kanbun 寛文 years (1661–1673) to include information on the activities of shogunate officials, as well as on construction projects, disasters, and weather conditions. Regarding the red vapor phenomenon, the text states: “In society, it was said that fire rain had fallen, and people were in a state of great agitation.”<sup>23</sup> This indicates the confusion caused by the appearance of the red vapor.

The “Ōmachi nenbutsukōchō” is a record from Ōmachi 大町 Village in Murayama 村山 District, Dewa 出羽 Province (present-day Kahoku 河北 Town, Nishimurayama 西村山 District, Yamagata Prefecture), covering the period from Jōkyō 貞享 2 (1685) to 1945. It documents a wide range of topics, including weather, crops, and prices. The *nenbutsukō* 念仏講 (a type of Buddhist lay group) also served as mutual aid organization for the village. We find the following description: “From the north, the entire sky was seen to be red, and people were alarmed, wondering if there might be fires in various locations. Upon observing the sky’s appearance, it was said to be sea fire or something similar. Since this is an exceptionally rare event, even the village elders could not recall anything like it, nor did anyone else know about it.”<sup>24</sup> We can see that the phenomenon was recorded because it was quite rare; even the village elders were unfamiliar with it. Both this ledger

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<sup>17</sup> *Kaitei Tenri-shishi*, p. 374.

<sup>18</sup> *Ōmachi nenbutsukō-chō*, p. 149.

<sup>19</sup> *Mitake chōshi*, p. 871.

<sup>20</sup> Takahashi, *Kinsei shakai keizai shiryō shūsei*.

<sup>21</sup> *Inuyama-shi shi*, p. 209.

<sup>22</sup> On the shrine organization of Aramaki village, see Ueno, “Aramaki no jinja saishi to shakai kōzō.”

<sup>23</sup> *Kaitei Tenri-shishi*, p. 374.

<sup>24</sup> *Ōmachi nenbutsukō-chō*, p. 149.

and the “Aramaki mura miyaza nakama nendaiki,” collectively managed records, suggest that maintaining a communal memory was the means for villages to make sense of incomprehensible astronomical phenomena.

The appearance of red vapor in records documenting planting conditions, like “Sakugara-hikae,” also reflects an understanding that the phenomenon affected agricultural activities. Meiwa 7 was a year of widespread drought across Japan, and the red vapor may have been perceived in connection with poor harvests.

Red vapor is also frequently mentioned in essays, most of which were written by intellectuals. Works such as *Enkōan zuikan zue* 猿猴庵随観図会,<sup>25</sup> *Hanjitsu kanwa* 半日閑話,<sup>26</sup> *Nochimigusa* 後見草,<sup>27</sup> *Oriorigusa* 折々草,<sup>28</sup> and *Kagomimi-shū* 籠耳集<sup>29</sup> were written shortly after the appearance of the red vapor, judging from the authors’ lifespans. In contrast, *Shōzan chomon-shū* 想山著聞集<sup>30</sup> and *Setsuyō kikan* 摂陽奇観<sup>31</sup> were written seventy-nine years and sixty-three years later, respectively, suggesting that red vapor remained widely known as a rare phenomenon among intellectuals for many decades. Additionally, various popular rumors were attached to the phenomenon, including absurd claims such as “the Great Buddha Hall of Tōdaiji 東大寺 burned down.” As discussed later, certain commonalities in these essay descriptions provide insights into how information about the red vapor spread. The red vapor was recorded in diverse sources, including diaries, annals, history books, and astronomical texts. The ways the red vapor was recorded were closely tied to how early modern people perceived such phenomena and communicated information.

## (2) Vocabulary for Describing Auroras

The field of the history of astronomy has held that auroras were described using the terms *sekki* and *hakki* 白気 (lit., white vapor). However, outside of that specialized field *sekki* has generally been understood to mean “red-colored cloud mists visible at night or in the evening” or comets, while *hakki* has been interpreted as “white vapor” or “white-colored cloud mists.”<sup>32</sup> The term *sekki* (Ch. *chiqi*) itself originates from Chinese historical texts such as the *Weishu* 魏書 (Jp. *Gisho*) and *Jinshu* 晉書 (Jp. *Shinjo*), where it was considered an ominous sign indicating plots or upcoming war. In Japan, the vocabulary

<sup>25</sup> In the collection of the Kotenseki Shiryōshitsu 古典籍資料室 of the Kokuritsu Kokkai Toshokan 国立国会図書館.

<sup>26</sup> Hamada, *Ōta Nanpo zenshū*, p. 343.

<sup>27</sup> In the collection of the Kokuritsu Kōbunshokan 国立公文書館.

<sup>28</sup> Nihon Zuihitsu Taisei Henshūbu, *Nihon zuihitsu taisei*, p. 103.

<sup>29</sup> Harada et al., *Nihon toshi seikatsu shiryō shūsei*, pp. 405–406.

<sup>30</sup> Tanigawa, *Nihon shomin seikatsu shiryō shūsei*, pp. 59–60.

<sup>31</sup> Funakoshi, *Naniwa sōsho*, p. 177.

<sup>32</sup> *Nihon kokugo daijiten*, p. 1371.

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for auroras shows slight variations over time. In the *Rikkokushi* 六国史, terms such as *shakkō* 赤光 (red light), *sekiun* 赤雲 (red cloud), and *hakuun* 白雲 (white cloud) may have been used to refer to auroras, with expressions such as “a thing like a *kanjōban* 灌頂幡 banner with a fiery color” used to describe their appearance.<sup>33</sup>

By the early modern period, phenomena where the sky turned red—not only auroras—were generally described as *sekki*, while comets were referred to as *hakki*. The term *sekki* was particularly common among intellectuals familiar with Chinese classics.<sup>34</sup>

Before the modern period, the aurora phenomenon itself was not widely recognized, so there was no established vocabulary to describe it. Consequently, the manner of description depended heavily on the education and knowledge of the recorder. Two examples of such records are presented below.

### Source 2<sup>35</sup>

“Tonight, on the twenty-eighth day, a red vapor appeared in the northern sky. Around the fourth hour, it resembled a distant fire. By around the ninth hour, the red vapor had grown significantly larger and higher, with numerous white streaks rising within it, appearing and disappearing. The red vapor gradually spread, extending east to west, across half the sky. By the eighth hour it had dissipated. Later I heard that the phenomenon was observed in many provinces.”

### Source 3<sup>36</sup>

At the fifth hour, red clouds appeared in the northern sky, which people initially thought indicated a distant fire. Gradually, the redness spread, covering the northern sky entirely. It looked like a folding fan made of red paper, with white streaks crossing like fan ribs. The phenomenon lasted until the ninth hour, leaving people deeply puzzled.

(In Japanese early modern timekeeping, the hours from sunset to midnight were six, five, four, and nine, and the hours after midnight were eight and seven.) Source 2 is an excerpt from the writings of Motoori Norinaga 本居宣長, while Source 3 is a diary entry by the Tadokoro 田所 family, Tanabe 田辺 unit *shōya* 庄屋 village officials in the Tanabe sub-domain of Kishū 紀州 (present-day Tanabe City, Wakayama Prefecture). Norinaga meticulously recorded the changes in the red vapor from its appearance to its disappearance, using the terms *sekki* (and *hakkin* 白筋) to describe it. In contrast, the Tadokoro family’s diary does not employ these terms, instead describing the phenomenon

<sup>33</sup> Kuroita, *Shintei zōho kokushi taikei Nihon shoki*, p. 365.

<sup>34</sup> Ōsaki, *Kinsei Nihon tenmon shiryō*, pp. 415–538, 583–596.

<sup>35</sup> Ōno and Ōkubo, *Motoori Norinaga zenshū*, p. 318.

<sup>36</sup> Tanabe-shi Kyōiku Iinkai, *Kishū Tanabe bandaiki*, p. 496.

as resembling “a distant fire” and “a folding fan made of red paper, with white streaks crossing like fan ribs.” This metaphor of a fan aligns with depictions in visual records of *seki*, accurately capturing the aurora’s appearance. In this way, the descriptions reflect the recorder’s knowledge and education, with unique metaphors drawn from familiar objects rather than consistent terminology.

## ***2. Responses and Perceptions of the Court and the Tsuchimikado Family to the Red Vapor***

Next, I will examine how different social groups responded to the occurrence of auroras. My analysis focuses on the imperial court, intellectuals, and the populace, comparing their reactions to the extraordinarily rare natural phenomenon of “red vapor.” First, let us consider the imperial court and the Tsuchimikado 土御門 family.

### **(1) The Imperial Court’s Response to Comets in Meiwa 6 and Meiwa 7**

The court’s response at the time of the red vapor of Meiwa 7 is closely tied to its handling of the comets that appeared in the seventh month of the same year (the Lexell comet) and the seventh month of the previous year (the Messier comet).<sup>37</sup>

After the appearance of the comet on the twenty-sixth day of the seventh month of Meiwa 6, Tsuchimikado Yasukuni 土御門泰邦, the *on’yō no kami* 陰陽頭 (chief official of the On’yōryō 陰陽寮, the Yin-Yang Bureau), and others submitted a report (*kanmon* 勘文) in response to a regent (*sesshō* 摂政) inquiry on the fourth day of the eighth month. The report cited the *Hanshu* 漢書 (Jp. *Kanjo*) and interpreted the comet as a harbinger of a great flood.<sup>38</sup> Following this, a *mikagura* 御神樂 dance was conducted at the *naishidokoro* 内侍所 (inner sanctum of the imperial palace) on the eleventh day. In the ninth month, another comet appeared, coinciding with a flood, epidemic, and the ill health of the crown prince, leading to its recognition as an ominous sign.<sup>39</sup> In the seventh month of Meiwa 7, another comet appeared, distinguished by its unusual shape, which Yasukuni identified as the planet called *haisei* 孛星 and deemed a bad omen. This time, in addition to the *mikagura* at the same location, the so-called “Big Dipper ritual” (*hokutō-hō* 北斗法) was performed by the former *daisōjō* 大僧正 (director of monks) Yūshō 有証. Despite these measures, a nationwide drought persisted, and notable figures such as Imperial Prince Kyōgoku-no-miya Kinhito 京極宮公仁 and Kujō Michisaki 九条道前, an imperial

<sup>37</sup> Regarding imperial court developments during the comets of Meiwa 6 and 7, I referred to Sugi, “Kinsei chūkōki no on’yō no kami.”

<sup>38</sup> “Seikai.”

<sup>39</sup> Sugi, “Kinsei chūkōki no on’yō no kami.”

<sup>40</sup> Ibid.

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court minister with the title *naidaijin* 内大臣, passed away in succession.<sup>40</sup> While the court considered prayers for rain, Yasukuni argued that conducting such prayers would revive the disaster attributed to the aforementioned planet that had been suppressed by the prayers of Empress Go-Sakuramachi 後桜町 and bring misfortune to the emperor, crown prince, and others. Thus, rain-prayer rituals were canceled.<sup>41</sup> However, when the red vapor appeared on the twenty-eighth day of the seventh month, the court was forced to respond.

### (2) The Perception of Tsuchimikado Yasukuni

On the twenty-ninth day of the seventh month of Meiwa 7, Yasukuni, who was visiting the court, was privately asked by Hirohashi Kanetane 広橋兼胤, liaison to the samurai class or buke tensō 武家伝奏, about the red vapor observed the previous night. Kanetane, suspecting remnants of the influence of the *haisei* planet, was told by Yasukuni, “The red vapor from last night is likely the work of yang fire (*yōka* 陽火) and thus akin to a sign of drought, just like before. However, the white vapor threading through the red light suggests a sign of overturning evil and suppressing ying (*fukuja fukuin* 覆邪伏陰). Therefore, it cannot conclusively be attributed to the influence of the *haisei*.”<sup>42</sup> Yasukuni later prepared a report with his colleagues and submitted it to the imperial court overseers called *gisō* 議奏. The content is as follows:

#### Source 4<sup>43</sup>

Humbly reporting on the unusual phenomenon:

On the night of the twenty-eighth day of the seventh month, the northern sky turned red. At the beginning of the hour of the rat, it grew intense, spanning from east to west like fire. Within the light were multiple streaks extending to the mid-sky. It disappeared by the hour of the tiger. According to previous interpretations, such changes in color signify military uprisings or calamities of wind or fire. However, being your humble and unwise servant, I cannot definitively establish its meaning. Yet among the various omens, it particularly corresponds to those of wind disasters, and perhaps there may also be an earthquake. I respectfully submit this report for your consideration.

Submitted on the first day of the eighth month of Meiwa 7

Abe no Asomi Yasukuni 安倍朝臣泰邦, Chief Official of the Ying-Yang Bureau

<sup>41</sup> Empress Go-Sakuramachi revived state prayers for rain during this period (Mase, “Kamo shimo kamisha no amagoi”).

<sup>42</sup> “Yasukuni kyōki,” entry for the first day of the eighth month of Meiwa 7.

<sup>43</sup> Ibid.

Yasukuni, while acknowledging that traditionally such phenomena were interpreted as indicative of uprisings or disasters involving wind or fire, instead suggests the possibility of a wind disaster or earthquake. After submitting this report, Yasukuni had a private discussion with Kanetane, who was considering holding prayers, informing him that the official report adhered to the traditional divination methods of the On'yōryō and did not reflect his personal view.<sup>44</sup> Yasukuni believed the red vapor was a response to the drought, expressing skepticism toward the traditional interpretation of it as a harbinger of military conflict or calamities of wind and fire, stating such divination was “unsuited to the current times.” Nonetheless, he acknowledged that his view diverged significantly from the teachings of his predecessors, leading to the submission of the report as shown in Source 4.<sup>45</sup> Yasukuni further commented on the appearances of the *haisei* and red vapor, stating, “The *haisei* is minor in size and causes little alarm for ordinary people. By contrast, the recent red vapor invaded half the sky with vivid red, astonishing and frightening people. However, in truth, the *haisei* is the more significant celestial change, while the red vapor lacks the same gravity.”<sup>46</sup> Yasukuni’s diary notes that his views were privately conveyed to Empress Go-Sakuramachi through Kanetane, although Kanetane’s own diary does not mention his private words with Yasukuni.<sup>47</sup>

The above highlights the considerable confusion caused within the court by the appearance of the red vapor in Meiwa 7, compounded by the comet sightings from the preceding year. Yasukuni viewed it as a consequence of drought and less significant than the *haisei*. This stance likely reflects his intention to maintain consistency with the official reports he submitted concerning Meiwa 6 and 7 comets. Celestial phenomena such as comets and red vapor were closely tied to the emperor’s body, making the reports highly significant. Yet Yasukuni held that the traditional *kanmon* reporting passed down within the Bureau was out of step with the times. The court’s handling of the red vapor thus exposed contradictions in the traditional astronomical interpretations of the imperial court and court nobles.

### **3. The Response of Intellectuals**

One notable feature of the descriptions of the red vapor from Meiwa 7 is their detailed documentation of changes in the light’s color and shape. These detailed accounts are consistently found among court nobles and scholars, reflecting how the intellectual class responded to and perceived the phenomenon.

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<sup>44</sup> Ibid.

<sup>45</sup> Ibid.

<sup>46</sup> Ibid.

<sup>47</sup> Hirohashi, “Hakkai gyoki,” entry for the first day of the eighth month of Meiwa 7.



### (1) Characteristics of the Descriptions and Perceptions

Among the records of the red vapor in Meiwa 7, the diary of Hakura Nobusato 羽倉信郷, a shrine priest of Inari Jinja 稲荷神社 in Inari 稲荷 Village, Kii 紀伊 District, Yamashiro Province (present-day Fushimi Inari Taisha 伏見稲荷大社), provides a particularly detailed account. His entry for the twenty-eighth day of the seventh month includes the following.

#### Source 5<sup>48</sup>

This evening, a red vapor appeared in the northern sky at the hour of the rooster. There were rumors that a great fire was burning in distant Wakasa 若狭 Province. By the hour of the boar, the reddish cloud mists grew brighter, spreading further northward across half the sky, near the Milky Way. Within these clouds, many streaks of white vapor rose vertically. This continued until the hour of the rat, with the red vapor brightening and fading intermittently, stretching from east to west and covering half the sky. Stars could be seen through the red vapor, and a single streak of white vapor extended across the Milky Way. By the hour of the ox, the phenomenon disappeared entirely. The weather was clear, and no clouds were visible in any direction. As the stars' light gradually reappeared, everyone at the shrine looked up and discussed the event. They concluded it was a celestial phenomenon never before discussed and something to be feared.

This account is notable for its detailed documentation of the changes in brightness and spread of the red vapor from around 4 p.m. to its disappearance at 2 a.m. From the hour of the boar onward, the entry records changes every zodiac hour. As can be seen in the description, “the reddish cloud mists grew brighter, spreading further northward across half the sky, near the Milky Way,” it empirically records changes in the red vapor while referring to its position vis-a-vis stars. Similar attention to changes over time is seen in Motoori Norinaga's diary (Source 2), while the relationship between the red vapor and constellations is recorded in the biography of Uchiyama Matatsu 内山真龍, a *kokugaku* 国学 scholar from Tōtōmi 遠江 Province. In the latter account, the red vapor's spread is described in relation to the North Star: “From the hours of the boar to the rat, a fiery vapor like cinnabar rose in the northern sky. Golden streaks rose therein, and it crossed the North Star.”<sup>49</sup> It is noteworthy that all these records come from *kokugaku* scholars. For intellectuals like Norinaga, Nobusato, and Matatsu, accurately recording the situation

<sup>48</sup> “Nippu,” entry for the twenty-eighth day of the seventh month of Meiwa 7.

<sup>49</sup> *Tenryū-shishi*, p. 245.

was their primary response to such an extraordinarily rare celestial phenomenon. Additionally, the intellectual class tended to look to the past and consult historical records to better understand the phenomenon.

#### Source 6<sup>50</sup>

*Nihon shoki* 日本書紀: In the eleventh year of Emperor Tenmu, on the *mizunoe saru* 壬申 day of the eighth month, the color of fire floated in the sky and flowed northward, visible in all provinces.

*Kōdai-reki* 皇代曆: On the eighth day of the seventh month of Hōji 宝治 9, at the hour of the boar, red vapor was seen in the northern sky, resembling wildfires. Within it were several streaks of white vapor crossing each other, obscuring the Big Dipper.

*Gogumaiki* 後愚昧記: On the nineteenth day of the sixth month of Jōji 貞治 2, after nightfall, there was unknown fiery light in the northeast and north, as though something was burning down in the distance. Some interpreted it as an omen of drought or a portent of fire.

*Wakuki* 或記: On the sixteenth day of the eighth month of Eikyō 永享 12, red light appeared.

*Kōnendaishiki* 皇年代私記: On a night in the first month of Tenshō 15, the northern sky was deep red.

*Jinshu*: On the night of the *renyin* 壬寅 (Jp. *mizunoe tora* 壬寅) day in the tenth month of Daan 大安 2 during the reign of Emperor Hui 惠, red vapor covered the sky.

*Tongjian* 通鑑: On the *guiyou* 癸酉 (Jp. *mizunoto tori*) day of the seventh month of Zhizheng 至正 27 during the reign of Emperor Shun 順 of Yuan 元, the capital's sky was filled with deep red vapor, illuminating the people like fire and lasting from the hour of the ox until the hour of the dragon.

Wenxian tongkao 文献通考: In the first month of Tianfu 天福 2 during the reign of Gao Zu 高祖 of the Later Jin (*Hou jin* 後晋) dynasty, there was red vapor in the northern sky at the beginning of the night. It stretched west to northwest and northeast to north-northeast, spanning three *jō* 丈 (approximately nine meters). Within the light, resembling fire, the *ziwei* 紫微 (Jp. *shibi*) and Big Dipper stars were visible. After the third watch, streaks of white vapor appeared inside it and moved westward until the middle of the night, before the hour of the rat.

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<sup>50</sup> “Gushin,” entry for the twenty-eighth day of the seventh month of Meiwa 7.

Source 6 is an excerpt from the diary of Yanagiwara Norimitsu (Motomitsu) 柳原紀光, who compiled the *Zokushi gushō* 続史愚抄. On the twenty-eighth day of the seventh month of Meiwa 7, he extracted descriptions of “red vapor” from Japanese historical texts such as the *Nihon shoki*, *Kōdai-reki*, *Gogumaiki*, and *Kōnendaishiki*, as well as from Chinese historical texts like the *Jinshu*, *Zizhi tongjian* 資治通鑑, and *Wenxian tongkao*. A similar approach can be found in the diary of Nonomiya Sadaharu 野宮定晴. His entry for the twenty-eighth day of the seventh month notes: “On the sixteenth day of the eighth month of Eikyō 12 [1440] during the reign of Former Emperor Go-Hanazono 後花園, the sky turned deep red. On the fifteenth night of the first month of Tenshō 10 during reign of Former Emperor Ōgimachi 正親町, deep-red vapor filled the northern sky. During the reign of Former Emperor Meishō 明正, from the sixteenth to the twenty-first day of the fourth month of Kan’ei 8, the sky turned red like a blaze, and on the twenty-sixth day of the seventh month of Kan’ei 12, the sky turned red like flames. It can be seen from this that celestial phenomena and geological abnormalities occurring without interruption this year is rare and extraordinary.”<sup>51</sup> While Sadaharu does not specify his sources, he lists the dates of past appearances of red vapor. The only overlap between Norimitsu and Sadaharu is the occurrence in Eikyō 12. Sadaharu focuses on occurrences from the fifteenth century to the first half of the seventeenth century, whereas Norimitsu draws from records spanning the second half of the seventh century to late sixteenth century. A notable difference is that Norimitsu confines his analysis to the terms *sekki* and *kōki* 紅気 (deep-red vapor), while Sadaharu gathers broader accounts of phenomena where the sky turned red. Here we can see the difference in their perceptions.

## (2) Interpretations of the Causes of Red Vapor

Some intellectuals sought to explain the causes of the red vapor. Juryōan Shūin 寿量庵秀尹 was one such individual, as evidenced in his work *Seikai* 星解, which translates to “explaining comets.” Regarding the causes of the red vapor, he writes:

### Source 7<sup>52</sup>

Reaching the hour of the ox, it was still prominent in the northeast. Red streaks appeared within the red color. It was like when floating clouds cover the sky and hide the sun before sunset, and sunlight leaks through gaps in the clouds, creating visible rays of light. Within the water vapor there were variations in thickness, and because of this, where it was thinner, the light shone through upward, appearing

<sup>51</sup> “Nonomiya Sadaharu-kyōki,” entry for the twenty-eighth day of the seventh month of Meiwa 7.

<sup>52</sup> “Seikai.”

like standing pillars. It is not a strange event. By dawn it had moved to the east, and by daybreak the red light disappeared. This was entirely caused by water vapor in the sky. While it is true that there was a long stretch of clear weather without rain, the frequent evening showers this month must be related to this phenomenon. Similar phenomena occurred during the Hōei 宝永 and Kyōhō years, so there is no need to debate the moral implications or omens of good or evil.

*Seikai*, written in the seventh month of Meiwa 7, offers explanations about comets. While little is known about Shūin, the content suggests ties to the Tsuchimikado family and astronomical perceptions influenced by *on'yōdō* 陰陽道. At the end, there is an illustration of red vapor as seen from Kyoto, making it a well-known source in the history of astronomy. Because of this illustration, it has been understood to be an astronomical document about auroras. However, its content includes (1) a diagram and report on the comet of the seventh month of Meiwa 6 by Tsuchimikado Yasukuni and his subordinate Kōtokui ke 幸徳井家; (2) diagrams and divinations of comets and ominous stars; (3) dates of comet appearances from Emperor Ichijō 一条 to Emperor Sakuramachi; (4) illustrations of red vapor; (5) dates of appearances of red vapor; (6) the summer “guest star” (Jp. *kakusei* 客星; Ch. *kexing*) and Jupiter’s eclipse in Meiwa 7; and (7) records of the red vapor of Meiwa 7. The book, begun in response to the appearance of Messier’s comet in Meiwa 6, was completed after documenting the Lexell comet in the following year. However, the section on red vapor was appended later as an addendum after its occurrence.

According to Source 7, Shūin attributed the appearance of red vapor to the evaporation of moisture from the ground. He explained the streaks of white vapor visible within the red vapor, which resembled beams of sunlight, as resulting from variations in the density of water vapor in the atmosphere. He suggested that the frequent evening showers in July, following a nationwide drought that year, were responsible for the appearance of red vapor. Thus, Shūin did not recognize red vapor as an astronomical phenomenon but instead understood it as a meteorological one, holding that it was not a “strange event.”

Currently, four manuscript copies of “*Seikai*” are extant. One copy, held by the Matsusaka 松阪 City Hall, was donated to the Matsuzaki Bunko 松崎文庫 of Ise Jingū 伊勢神宮 by the Kyoto bookseller and known bibliophile Murai Kogan 村井古巖 in Tenmei 3 (1783). From the colophon, it is evident that manuscript copies were being produced among the low ranking priests of Ise Jingū (onshi 御師).<sup>53</sup> Another copy was found in the

<sup>53</sup> Ibid.

<sup>54</sup> Hiraishike Monjo 平石家文書 (in the collection of the Hikone Shiritsu Hikone Toshokan 彦根市立彦根図書館). “*Seikai*” is also found in the Tōhoku Daigaku Fuzoku Toshokan Kano Bunko 東北大学附属図書館狩野文庫 and the Jingū Bunko 神宮文庫.

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collection of Hiraishi Tokimitsu 平石時光, an astronomer from the Hikone 彦根 Domain,<sup>54</sup> indicating that the text may have been circulated among intellectuals to some extent.

Another interpretation of the cause of red vapor can be found in “Mito kinen” 水戸紀年, a historical text compiled by Ishikawa Shinsai 石川慎斎, a Mito 水戸 Domain retainer. Although no specific date is provided, the entry for Meiwa 7 describes the event as follows: “Around autumn of this year, red vapor suddenly appeared in the northern sky one night, resembling a fire. It lasted for about an hour before disappearing. Those who witnessed it were astonished, interpreting it as an omen of drought. Indeed, the following summer and autumn were marked by severe drought. It was also said that this year marked the first arrival of a Russian ship in Ezo, and in hindsight, this red vapor was seen as a sign of [those] red barbarians’ [*akaezo* 赤夷] intent to invade our land.”<sup>55</sup> Shinsai, a pupil of Tachihara Suiken 立原翠軒, who was an adversary of Fujita Yūkoku 藤田幽谷, worked on compiling “Suitō taiki” 垂統大記 and later produced “Mito kinen” as its by-product in Bunsei 文政 10 (1827).<sup>56</sup> His interpretation linking red vapor to the arrival of foreign ships suggests that his academic background and the social context of the time significantly influenced his understanding of the phenomenon.

### **4. Popular Responses and Perceptions of Red Vapor**

Finally, I will examine how the populace responded to and perceived the appearance of red vapor, focusing on essays and other records.

#### **(1) Popular Responses in *Enkōan zuikan zue***

One example of how ordinary people reacted to red vapor can be found in “Enkōan zuikan zue” (hereafter “Zue”), an illustrated essay documenting events witnessed by the public. Its author, Kōriki Tanenobu 高力種信 (1756–1831), known as Shinzō 新三, adopted the pen names Enkōan 猿猴庵 and Enkō 艶好. Tanenobu served as part of the *ōban* 大番 and *umamawari* 馬廻 guards in the Ōwari Domain and was a prolific cultural figure who authored illustrated essays such as “Tōgai benran zuryaku” 東街便覧図略 and “Okuwa matsuri shinkei zuryaku” 御鋤祭真景図略. “Zue” chronicles events that occurred in the Nagoya region between Meiwa 4 (1767) and An’ei 安永 7 (1778), including festivals such as the Okuwa matsuri 御鋤祭 of Atsuta Jingū 熱田神宮, droughts, and epidemics. One illustration depicts the red vapor phenomenon as vertical streaks of red light rising from the Nōbi 濃尾 Plain, with startled ordinary people looking on below.

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<sup>55</sup> *Ibaraki-ken shiryō*, p. 560.

<sup>56</sup> See the explanatory materials in *Ibid.*

The following description accompanies the illustration:

**Source 8**<sup>57</sup>

On the evening of the twenty-eighth day of the seventh month, the northern sky turned faintly red. Initially thought to be a distant fire, the color gradually deepened as night fell, becoming as bright as a moonlit night. By the hour of the dog, the red vapor intensified, and several white streaks, like poles, appeared, spreading across half the sky from east to west. The ground was entirely bathed in red, causing people to panic. At local shrines, some performed kagura, others recited the *nenbutsu* 念仏, feeling as though their lives were in jeopardy. Many wondered if it signaled the end of the world or that fire rain might fall. Some poured water on their roofs, while others climbed to higher ground to observe. Within the red vapor, sounds akin to boiling could be heard. By dawn, the phenomenon had dissipated, dividing eastward and westward.

Based on this source, the people's responses can be summarized as: (1) preparing for fires and (2) praying to deities and buddhas/bodhisattvas. The red vapor initially led many to mistake the red vapor for distant fires or sea fires. The phrase "fire rain," which appears in "fire rain might fall," is also found in other sources.<sup>58</sup> Similarly, references to prayers include descriptions such as "people prayed to the deities,"<sup>59</sup> "rituals were conducted at various places,"<sup>60</sup> and "the people visited local shrines to offer prayers, staying overnight."<sup>61</sup> As red vapor spread in the sky, people realized the phenomenon was not a fire, people sought protection by praying at tutelary shrines and elsewhere.

Another notable response was seeking shelter in "earthen chambers" or "stone chambers" to avoid harm from the red vapor.<sup>62</sup>

**(2) Perceptions of Red Vapor**

As previously noted, intellectuals often sought to verify past occurrences of red vapor, but this retrospective approach was also observed among ordinary people. Records include statements such as, "This is something even the elders have never heard of before"<sup>63</sup> and "An extremely rare phenomenon since the ancient past; even the elders have no knowledge

<sup>57</sup> Kōriki, "Enkōan zuikan zue."

<sup>58</sup> *Tawaramoto-chōshi*, p. 921; (16) *Kaitei Tenri Shishi*, p. 374; *Fuji-gun Imaizumi-mura hōkan*, pp. 567–568.

<sup>59</sup> *Sakurai-shishi*, pp. 457–458.

<sup>60</sup> Tanabe-shi Kyōiku Iinkai, *Kishū Tanabe bandaiki*, p. 496.

<sup>61</sup> *Inuyama-shishi*, p. 209.

<sup>62</sup> "Oriorigusa," pp. 54–55; "Enkōan zuikan zue."

<sup>63</sup> *Hirakata-shishi*.

<sup>64</sup> *Ōmachi nenbutsukō-chō*, p. 149.

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of it, nor can they explain it today.”<sup>64</sup> Other accounts mention not elders but rumors that include distant places: “People in Matsumae 松前 say the same thing happened at the same time in the same manner, while people’s reports from Nagasaki are similar, though those from Kaga 加賀 are slightly different”<sup>65</sup> and “Accounts from various villages indicate that the same thing occurred throughout many provinces.”<sup>66</sup> While intellectuals sought understanding through historical texts, the masses relied on oral information. This highlights a difference in how each group gathered and transmitted knowledge. Descriptions emphasizing that even elders do not know anything about the red vapor phenomenon may have also served to underscore its rarity, but among ordinary people, memory and oral tradition passed down by elders were valued, and when interpreting rare natural phenomena, oral information took precedence over written records. As one account states, “We had heard elders’ recollections of some similar events in recent eras, but actually witnessing such a phenomenon firsthand was truly extraordinary.”<sup>67</sup>

Next, I will address whether the populace viewed red vapor as a good or bad omen. Its reddish hue generally led people across all social strata to consider it a bad one. However, there were cases where it was interpreted as a good one. For instance, Takebe Ayatari’s 建部綾足 essay *Oriorigusa* notes, “An old man said, ‘I remember it well. In a year when there was a similar vapor, the rice harvest was excellent, bringing great prosperity to the land. It was truly a good sign.’”<sup>68</sup> This interpretation, tying red vapor to prosperity, appears related to societal stability. Similar to how comets were sometimes viewed as good omens during periods of stability, their long tails were likened to ears of rice, symbolizing an abundant harvest.<sup>69</sup> This elder’s understanding of red vapor parallels comet interpretations.

Finally, let us consider how the masses explained why the red vapor arose. Given the nationwide drought in Meiwa 7, many attributed its occurrence to the drought, as intellectuals did.<sup>70</sup> Some records paired the comet sighting in the seventh month with the red vapor, indicating that people interpreted the two in relation to each other.<sup>71</sup> Particularly notable is the statement, “On the fifth day of the eighth month, heavy rain fell as if pouring from a basin. Then, it again rained heavily at daybreak [the next day], and the sky’s appearance suddenly changed and a refreshing coolness set in. Rivers and wells returned to normal, and the strange rumors that had filled the streets subsided.”<sup>72</sup> This suggests that the heavy rains on that day following the red vapor alleviated people’s

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<sup>65</sup> “Oriorigusa.”

<sup>66</sup> *Inuyama-shi shi*, p. 209.

<sup>67</sup> “Oriorigusa.”

<sup>68</sup> Ibid.

<sup>69</sup> Sugi, “Shoseki to fōkuroa.”

<sup>70</sup> “Ryūnenji ruki,” p. 185; “Sakugara-hikae,” p. 110.

<sup>71</sup> “Eitai kakoroku,” p. 623–24; “Ruinen oboegaki shūyō”; etc.

<sup>72</sup> Funakoshi, Naniwa sōsho, p. 177.



anxieties about the phenomenon. In other words, for the populace, the red vapor was linked to the drought and the comet sighting earlier that year. When the rains ended the drought, anxieties about the red vapor dissipated, and it came to be interpreted as a harbinger of rain—a good omen. Over time, it was recorded as a rare event, and even those who had missed witnessing it expressed regret.<sup>73</sup> For ordinary people, understanding celestial events like red vapor was less dependent on textual information and more tied to immediate environmental changes, marking a significant distinction from intellectuals.

### **Conclusion**

This paper has examined societal responses to and perceptions of red vapor, a rare astronomical phenomenon occurring approximately once every fifty to eighty years, using the example of its occurrence in Meiwa 7. Due to limitations in historical records, it was impossible to clarify the Edo shogunate's response. However, the accounts of daimyo, the imperial court, intellectuals, and ordinary people were analyzed to identify distinctive characteristics in their documentation. Among daimyo families, records of red vapor are extremely rare, with mentions found only in the domains of Hirosaki and Nanbu 南部, though their responses to the phenomenon remain unknown. At the imperial court, the phenomenon was linked to the body of the emperor, prompting discussions on whether to conduct prayers. This led to deliberations between the samurai class liaison Hirohashi Kanetane and the On'yōryō Head Tsuchimikado Yasukuni on whether the red vapor was a good or bad omen. Of particular interest is Yasukuni's recognition that while he followed traditional protocols in composing official reports, such reports no longer aligned with contemporary realities.

On the other hand, intellectuals and the populace, including some court nobles, sought to contextualize the red vapor by tracing similar celestial events in the past. Intellectuals referenced historical texts from Japan and China, while ordinary people relied on stories from elders and local rumors. Also, the latter recorded the red vapor in historical sources such as village official diaries and chronicles but also in collectively managed records related to festivals and religious associations, ensuring its preservation as a communal memory. The inclusion of the red vapor in records related to droughts and harvests suggests that it was understood as essential information for sustaining livelihoods, such as agriculture.

While red vapor was an extremely rare celestial event, it is recorded to have occurred at least three times during the Edo period. However, due to weather conditions and the timing of geomagnetic storms, the extant records are inconsistent, making comparisons

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<sup>73</sup> “Enkōan zuikan zue.”

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difficult. Therefore, this paper focused on the Meiwa 7 event, the most well-documented instance. The differences in records across social strata reflect the fundamental approaches to documenting, transmitting, and managing information about rare natural phenomena within each social group.

(Translated by Dylan L. Toda)

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