



The dry fog of 1783: new data on the first occurrence in Italy and its optical effects

„Суха мъгла“ от 1783: нови данни за първото ѝ появяване в Италия и нейните оптични ефекти

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The year 1783 was considered in Europe as ‘Annus Mirabilis’ or ‘Year of Awe’ because it was dominated by several large-scale extreme climatic, volcanic and tectonic events. The unusually hot summer of 1783 that marked Western Europe and North America, was followed by one of the harshest winters (1783–1784) that was characterized by low temperatures, frozen soils, frosted rivers and a high rate of snow accumulation. After the sudden warming, rainfall had led to fast snowmelt, causing a series of destructive floods across Central and Northern Europe (Brázdil et al., 2010). A very strong earthquake struck in Calabria (Italy) on February 5, 1783. In late February a submarine eruption off the southwest coast of Iceland formed a new island named Nýey that disappeared soon after. Moreover the Asama volcano, located in Japan, erupted intermittently from May to August 1783, and different volcanic eruptions occurred in the Italian Peninsula at Stromboli, Etna and Vesuvius. The year 1783 was also well noted by the Laki fissure eruption that began on June 8, 1783 and ended on February 7, 1784. The Laki eruption was the second largest basaltic lava flow event in the last 2000 years, following the 934–940 Elgiá eruption (Thordarson and Self, 2003). The Icelandic Laki eruption produced a large volume of lava, while the associated aerosols were directly responsible for severe environmental and health effects in Iceland and northern Europe (Courtillot, 2005). The most amazing phenomenon of 1783 was the persistent and widespread sulfuric cloud, referred to in contemporary chronicles as the “dry fog”. Dry fogs are a peculiar natural phenomenon. They are clouds of volcanic aerosols and gases,

which remain captured and trapped in the planetary boundary layer. These kinds of fogs are produced by relatively minor, climatically ineffective, volcanic eruptions. Dry mists are also generated by continuous fissure eruptions that quietly release volumes of free flowing lava, which is degassed. They are the result of irregular gas escape in conditions of atmospheric stability. According to Camuffo and Enzi (1995) dry fogs consist of mist, composed of foul smelling and malodorous gases and aerosols, which don’t wet surface. Dry fogs are characterized by a reddish color and could be formed mainly at the beginning of the hot season, persisting even up to the middle of the day. Dry mists are often associated with the appearance of red dusks, weak sun and solar or lunar halos. Furthermore, another distinctive feature of dry fogs is the remarkable and extensive damage to harvests, vegetation, animals and people as well.

According to Camuffo and Enzi (1995), Grattan et al. (1998) and Thordarson and Self (2003) the dense, dry, sulphurous fogs related to the prolonged Laki fissure eruption took appearance first in Italy in June: 18 June, 1783 in Turin; 17–18 June in Padua; 19 June in Bologna and 16 June in Rome. This research focuses on the analysis and the critical re-reading of primary historical sources and weather observations carried out by Augusti (1784), di Gennaro (1784), della Valle (1784) and Corradi (1870). Then, from Northern to Southern Italy, the Laki haze was also observed in Monferrato, Siena, Montecassino, Naples, Portici and Reggio Calabria.

Naples: “In my private atmospheric observations, which I do daily, I find noticed the principle

of that haze on June 17, cluttering up the southern part. This came after the day of the 16th that was a very clear day, so fresh, especially towards evening, that it felt more in winter than in early summer. For several days the sun, radiated very pale rays, showed its fiery disk, like a lit ember. The same has happened in the lunar atmosphere four times. One and the other atmosphere were accompanied by a gloomy color like a wrinkled red. The good vegetation of the plants has not been prevented by our haze, although it has invested the fodder in their ripening: but it seems rather, that it has helped the products of the land later, which are abundant, and of excellent quality. Finally on July 24th, after a strong southern wind of libeccio, at 22 hours we saw the pure, clear sky, and we saw the nearby mountains of the coast, which we had not seen for 28 days. At last, the phosphorus stench, which accompanied the fog, at last denotes a greater phlogiston, and the severe heaviness, which apparently caused the head, and lungs, which still indicates to be a product of sulfide minerals, and bitumen” (Augusti, 1784).

Portici: “Throughout the previous month of May, and in much of the current June this atmosphere of ours suffered continuous alterations, and events of heat, or cold, without that day ever happened perfectly, and equally serene, and peaceful. A foreign steam was always seen in the air, which disturbed its calmness, and its healthiness; so a lot of diseases are derived from it. That atmosphere, therefore, has been presenting the following periodic show to our eyes for many days. Very thin haze occupies the sky, of an equal weaving, and without any of these volumes, which clouds we call. This veil takes away the clear face of the major planet, whose morning ray passing sideways of the said veil acquires an ochre color. At noon it is stiffer than it should be this season. At the breath of the winds the veil is thinning, but not as a sign of leaving the sun totally clear, and the turn of the sky serene. The veil becomes thicker towards sunset; and here the most beautiful point of the show. The sun declines, and in proportion that goes into the narrowest haze, it is stripping itself of its always dazzling, though veiled light, so that an hour before the set his disc all naked with rays, indeed dressed in rosy color, becomes an object of wonder, and of pleasure to our pupils, who with impunity in him fasten themselves” (di Gennaro, 1784).

Reggio Calabria, Siena and Monferrato: “In Reggio Calabria for several days (before 11st July) the horizon and zenith are covered by a thick and very dense exhalation, which impede the view of the nearby countryside, Sicily and the stars. The sun

appears without rays, blood red colored and so it appears even the moon. In Siena (before 6th August) it appeared towards the middle of June, it was believed one of the mists exterminating the wheat, but experience showed the opposite. During the early July, it had a major growth. The light remained so blocked by the smoke of the atmosphere. so at mid-day the sun was not seen well. It appeared red and dark and in the same way the moon and the other celestial bodies, mainly when they were observed close to the dawn and at sunset. In the Monferrato since two months ago (before 31st July) we have a dry and a low fog, which despite the hot days and the rains, does not dissipate, but does not cause damage” (della Valle, 1784).

Montecassino: “For several days (before 20th June) a haze is seen spreading all over the horizon, which also seems different from the ordinary, and that neither the rays of the sun, nor the continuous rains, cannot dissolve” (Corradi, 1870).

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