Church of the Nativity of the Virgin - Gelati Monastery

Article on the emergency conservation-restoration intervention of the Frescoes

Introduction.

From 22nd to 28th of June, Italian conservator-restorers Marco Pulieri and Vincenzo Centanni, together with a group of Georgian conservation-restoration technicians, conducted, for the first time, with a work at heights, a campaign on the state of conservation of the frescoes in the vaults of the Church (west, north and south arms) which had previously beenaffected by water infiltrations from the roof. During this mission, in addition to an accurate observation of the state of degradation, various samples of material were taken in order to realize laboratory analyzes in order to achieve an initial characterization of the constituent materials (masonry, plasters, colors, etc.), and arecognition of the factors and consequently of the degradation effects and "products".

In the same period, a series of further diagnostic investigations were defined in order to measure the humidityin the vaults and walls of the Church, to quantify the salts present in the masonry and to study the environmental microclimate of the building. All these further investigations, already planned and entrusted to experts with recognized international experience, will be done by the end of October 2021, in order to conclude this first diagnostic part and allow the definitive design of the conservation and restoration interventions on the damaged frescoes to be carried out extensively.

In the first mission in June 2021, one of the primary objectives was to study the intervention methodology for the consolidation of the pictorial film, raised by the crystallization of soluble salts. Therefore, the restorers just carried out only very small color re-adhesion tests, as well as small consolidation tests of plaster detachments, of removal of superficial saline efflorescences and a first extraction of the salts found in the most superficial layers of the plasters. The execution of all the samples was performed with techniques and materials of recognized, analyzed and proven validity, in hundreds of conservation-restoration interventions carried out, over a period of at least forty years, on wall paintingsof the same type of those present in the Church of the Nativity of Gelati.

Emergency response mission (September 16th-21st).

As foreseen by the June agreements, the frescoes of the Church of the Nativity were continuously monitored to follow the evolution of the ongoing degradation. Between the end of August and September, this activity detected the subsidence of the temporary containment measures(fastening of the layers of detached plaster by thin veiling made with small strips of Japanese paper fixed with acrylic resin) carriedas an emergency work by the Georgian restorers in the previous month of March 2021 (?).

Unfortunately, these interventions are only useful for a temporarily securing of the detachments of decorated plaster butthey are insufficient to guarantee their endurance over amedium-long period of time and therefore to avoid collapse of the detached parts. As a matter of fact, in the aforementioned

period some protective bandages gave way and caused the fall or a further detachment of fragments of painted plaster.

As described above, thanks to the personal interest of Minister Madame Tea Tsulukiani, through a contract stipulated by the National Agency for Cultural Heritage Preservation of Georgia with the AssociazioneGiovanni Secco Suardo, between 16 and 21 September a new mission was organized in the Church of the Nativity, led by the conservator-restorer Vincenzo Centanni together with a group of Georgian conservator-restorer collaborators directed by the conservator-restorer MerabBuchukvri.

The mission objectives were the following:

- monitoringthe current state of conservation and comparing it with what was previously detected in June 2021;

- monitoringthe state of conservation of the parts previously subjected to color fixing tests, to consolidation of plasters and extraction of soluble salts present on plasters, confirming, over time, what has already been recorded on the validity of the execution techniques and materials used in the June 2021 interventions;

- immediate consolidation of the pictorial film, according to the previously verified methodology, in all the parts where a state of conservation that highlights the danger of imminent fall of portions of the painting is detected (exfoliation, pulverization);

- immediate consolidation of the layers of plaster, according to the methodology already verified previously, in all points where a state of conservation that suggests a danger of imminent fall of portions of the frescoed plaster is detected (detachment, lifting, disintegration);

- Photographic documentation and technical report of the intervention;

- Implementation of a training course, conducted during the period of presence of the conservator-restorer Vincenzo Centanni at the Gelati Monastery together with the group of Georgian conservator-restorers involved, to deepen and share the techniques and materials used in the conservation-restoration interventions, in order to guarantee in the immediate future, in any case of need, the continuation of the necessary conservation operations on the frescos.

Conservation-restoration interventions performed.

The entire vault and the shoulder walls of the west arm of the church (wherescaffolding is present) were monitored and the state of conservation was compared with what was observed and detected in the previous month of June 2021.

From this comparison itmainly emerged that:

- the saline efflorescences, still present, insist on the same points detected previously and no new areas affected by this phenomenon have appeared;

- the walls were drier than in June 2021 (obviously the instrumental measurements that will be carried out in the upcoming weeks will confirm this data), and the relative humidity measured in the days of the mission did not exceed 68% (during the mission of June it had been peaking at 87.5%);

- the exfoliation of the pictorial film and the detachments of plaster already detected in June 2021 appeared more pronounced in several points and in a condition of possible imminent fall (masonry shoulder and south side arch base, central part of the vault);

- some protective bandages made in previous interventions, in different areas, have yielded or partially lost their adherence, and that some support fillings around portions of decorated plaster, carried out in past conservation operations, have been partially detached or fallen;

- the areas previously affected by biological attacks (bacteria, fungi, analyzed in June 2021) remained confined to the same previously detected areas;

- the fixing samples of the paint film and the plaster consolidation samples, made in June 2021, showed a perfect seal. In the same areas no new exfoliation, no new plaster detachments were detected and no new saline efflorescence appeared on the painted surfaces.

Following the monitoring, a series of interventions were carried out, aiming at the stabilizationof the most degraded parts and those in danger of imminent loss, thus ensuring their correct conservation. In these operations the same executive methods and the same materials already tested in the previous mission were used.

The exfoliation of the pictorial film was consolidated to the underlying layer of plaster by applying on the painted surface a folio of Japanese paper, adhered by the use of deionized water and exerting pressure with soft pads in order to re-stick the lifted portions of pictorial film.Subsequently, again through the paper layer (filter), a solution of deionized water and acrylic resin in aqueous emulsion (3%) (Acrill 33 / EA-MMA) was applied.

Pressure was exerted again on previously treated parts with soft pads, to improve adhesion to the support of the previously raised paint film.

In case of thicker color exfoliation, again through the filter of Japanese paper,a solution of the same consolidant with a higher percentage of resin (5%) was injected under the raised color layer.

Before fixing the color, in the areas wheresaline efflorescences were evident, the latter were removedwith meticulous attention, first dry by using soft bristle brushes and then by compresses of

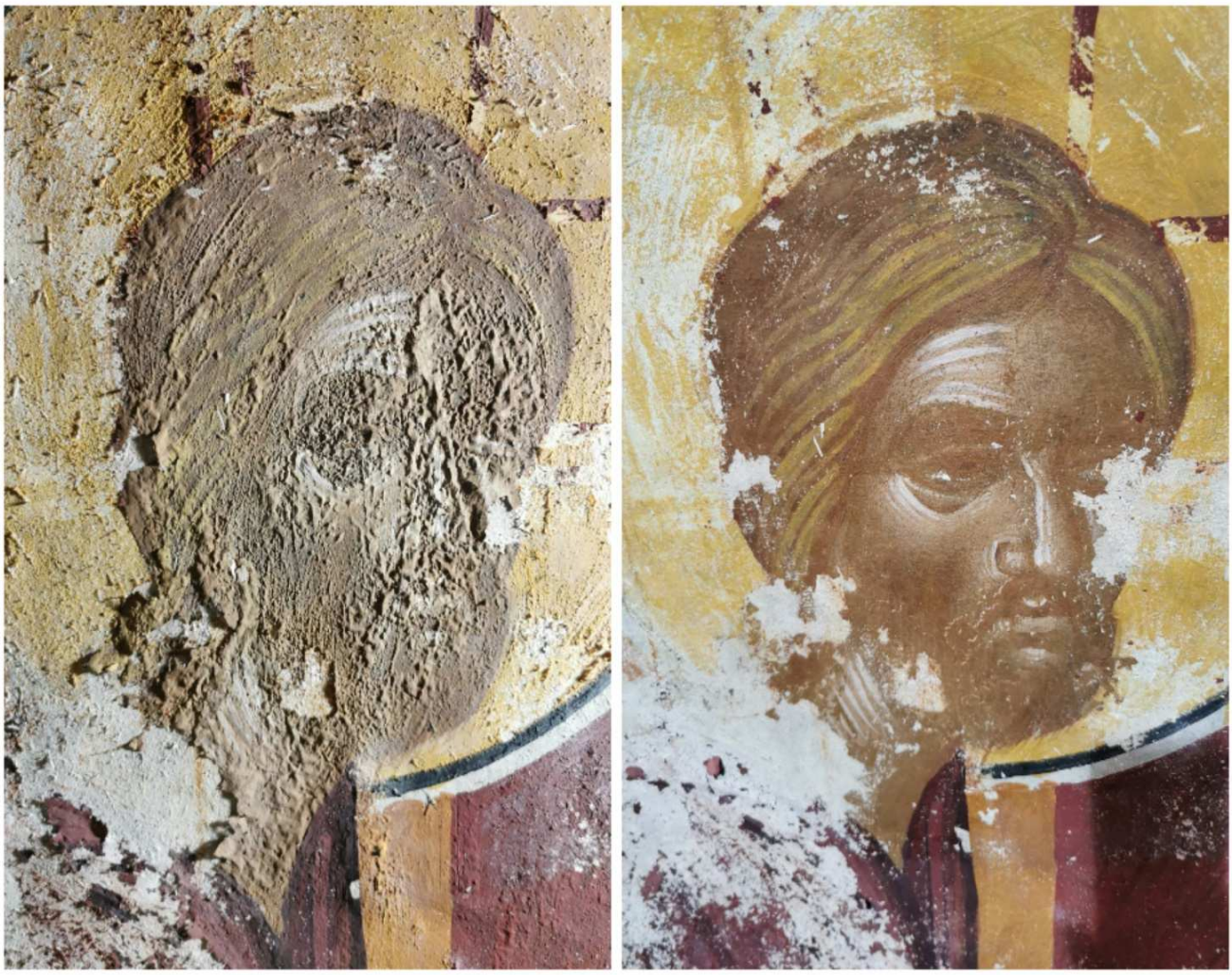
deionized water kept in contact with the surface with a first layer of Japanese paper upon which 3 layers of soft absorbent pure cellulose paper have been superimposed.

The detachments between the various layers of plaster have been consolidated by injections of two types of premixed mortar opportunely studied, tested and composed for the targeted and specific use in the conservation and restoration of decorated surfaces of the architecture of historical and artistic value. The injected mortars are mainly based on natural hydrated lime free from efflorescingand inert salts selected also according to the characteristics of use (PLM A - Plaster of masonry / PLM Al - with low specific weight ideal for plaster of vaults or for large detachments thickness). The portions of plaster to be consolidated that had gaps of great thickness were previously coated with a sheet of Japanese paper applied with a 10% resin solution (Methylacrylate-Ethylmethacrylate / Paraloid b72) dissolved in acetone, while the detached edgesof the plaster were sealed with a (temporary) mortar based on slaked lime (natural air binder based on lime hydroxide) and siliceous aggregates. The consolidations by means of mortar injections continued until the total adhesion between the various layers of plaster and between these and the load-bearing masonry.

The plaster areas affected by biological attacks (bacteria, fungi) were treated with a double spray (one day apart from each other) of a solution of 2% quaternary ammonium salts in deionized water. One day after the treatment, the residues of the mushrooms, still present on the masonry, were easily removed with soft bristle brushes, taking care to collect them - as we proceeded - thus avoiding their spreading on the surrounding surfaces.

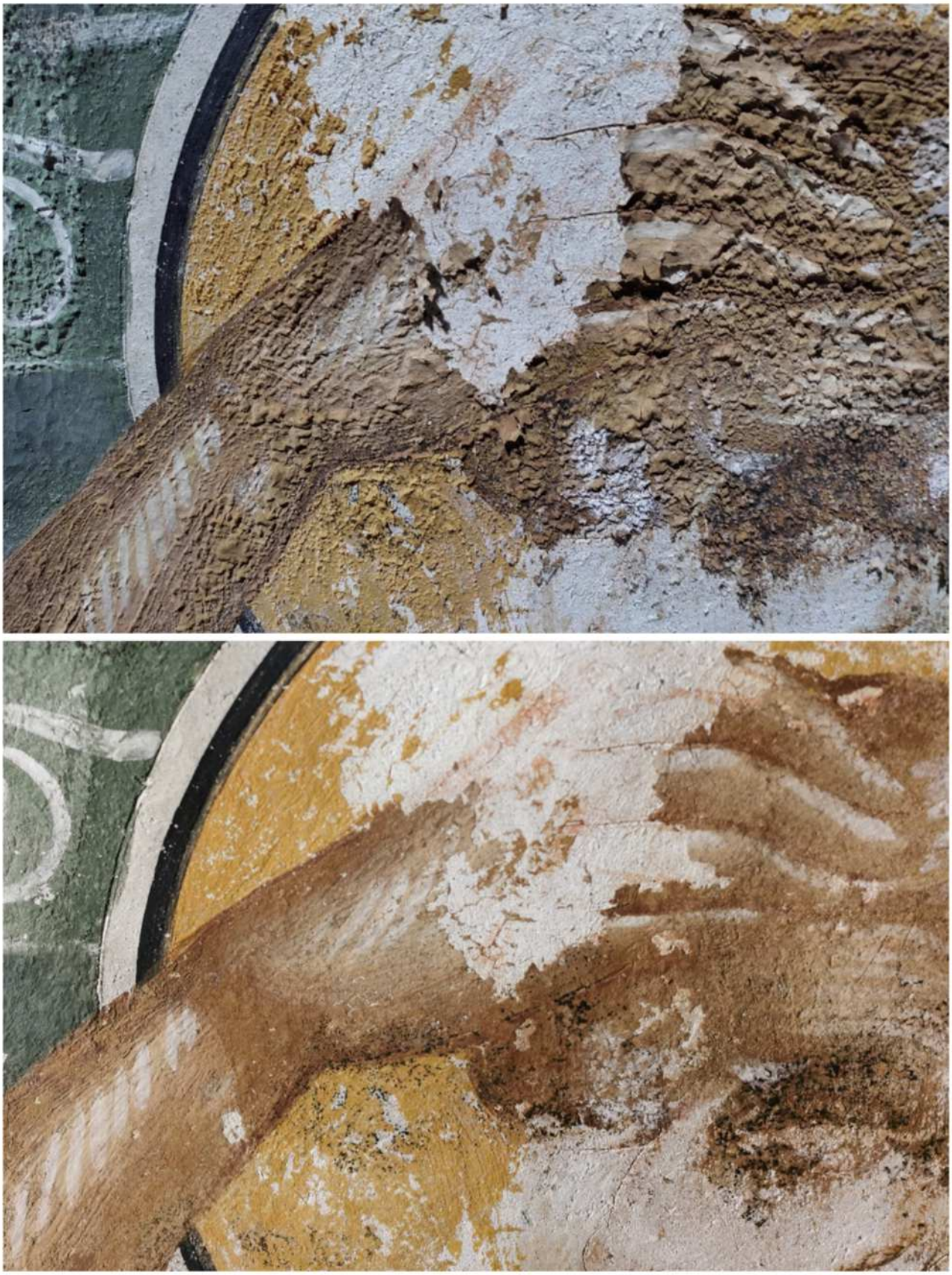
Conclusions.

The days of the mission passed, among all the professionals involved, in an atmosphere of great collaboration and transparent sharing of the conservation objectives of the Works of Art degradade. All this was fundamental in sharing the necessary cognitive and executive in-depth studies, between the conservator-restorer Vincenzo Centanni and the group of Georgian conservators-restorers who will be able to concludein autonomythe emergency conservation-restoration interventions, already started on the most degraded points of the frescoes of the Church of the Nativity.



Fixing of the raised paint film

Fixing of the paint film and removal of saline efflorescence



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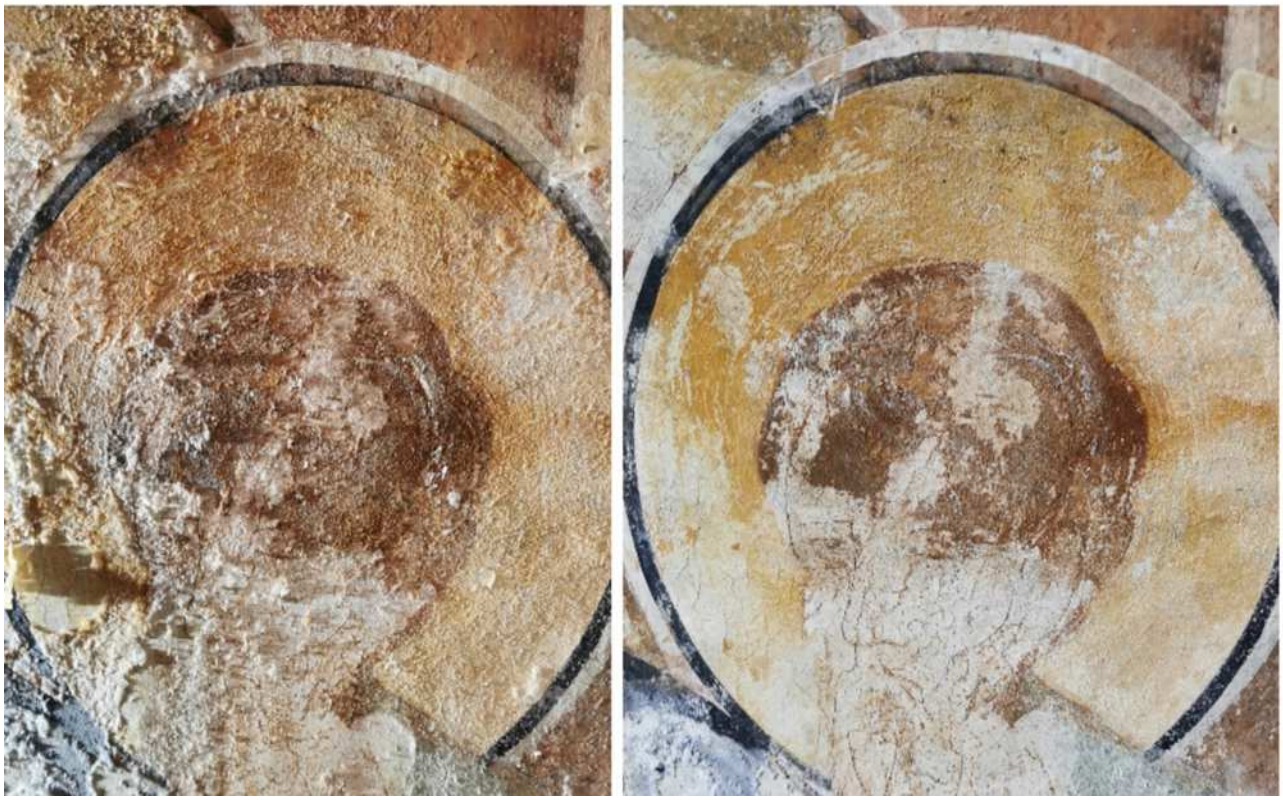

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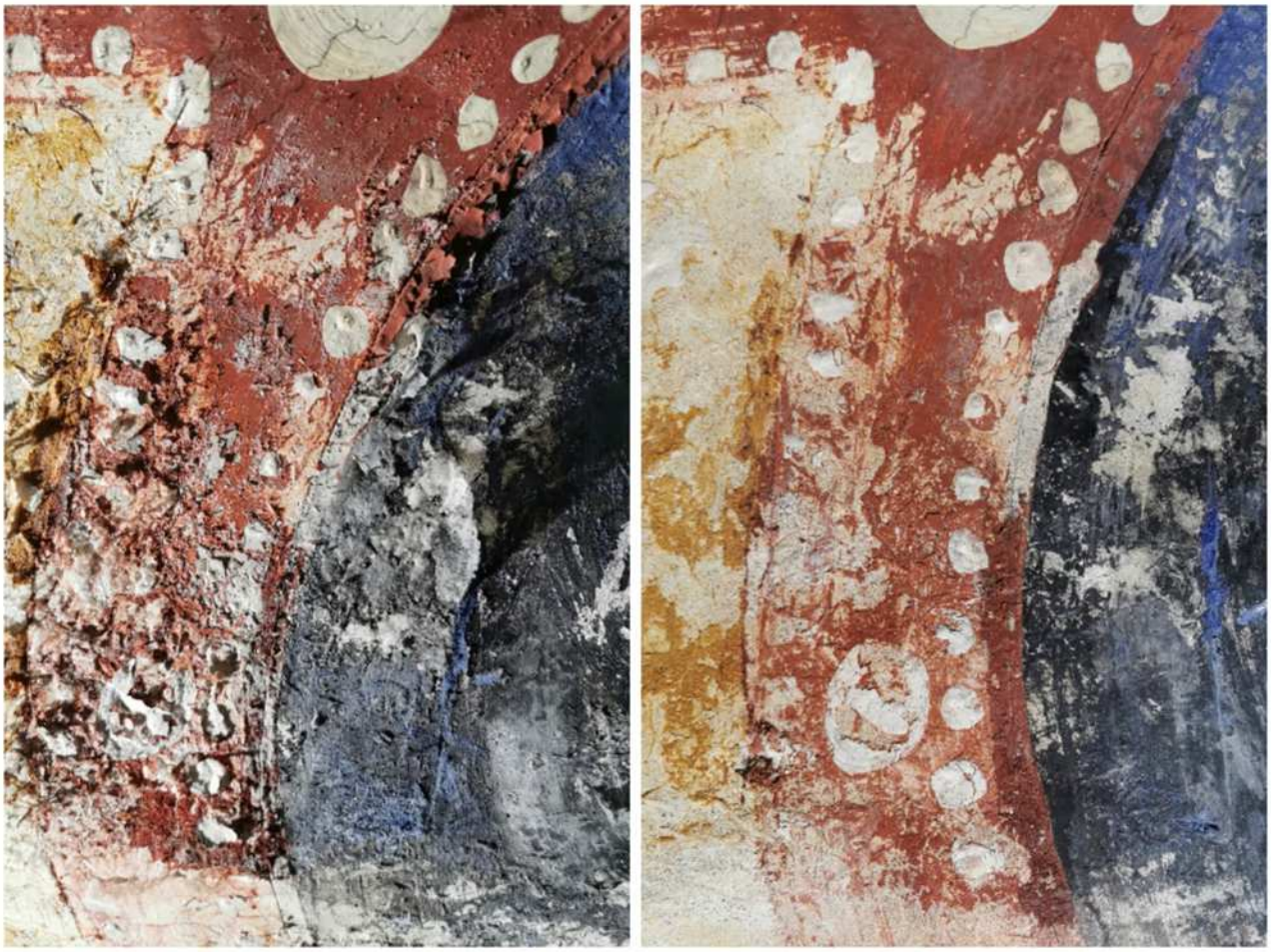

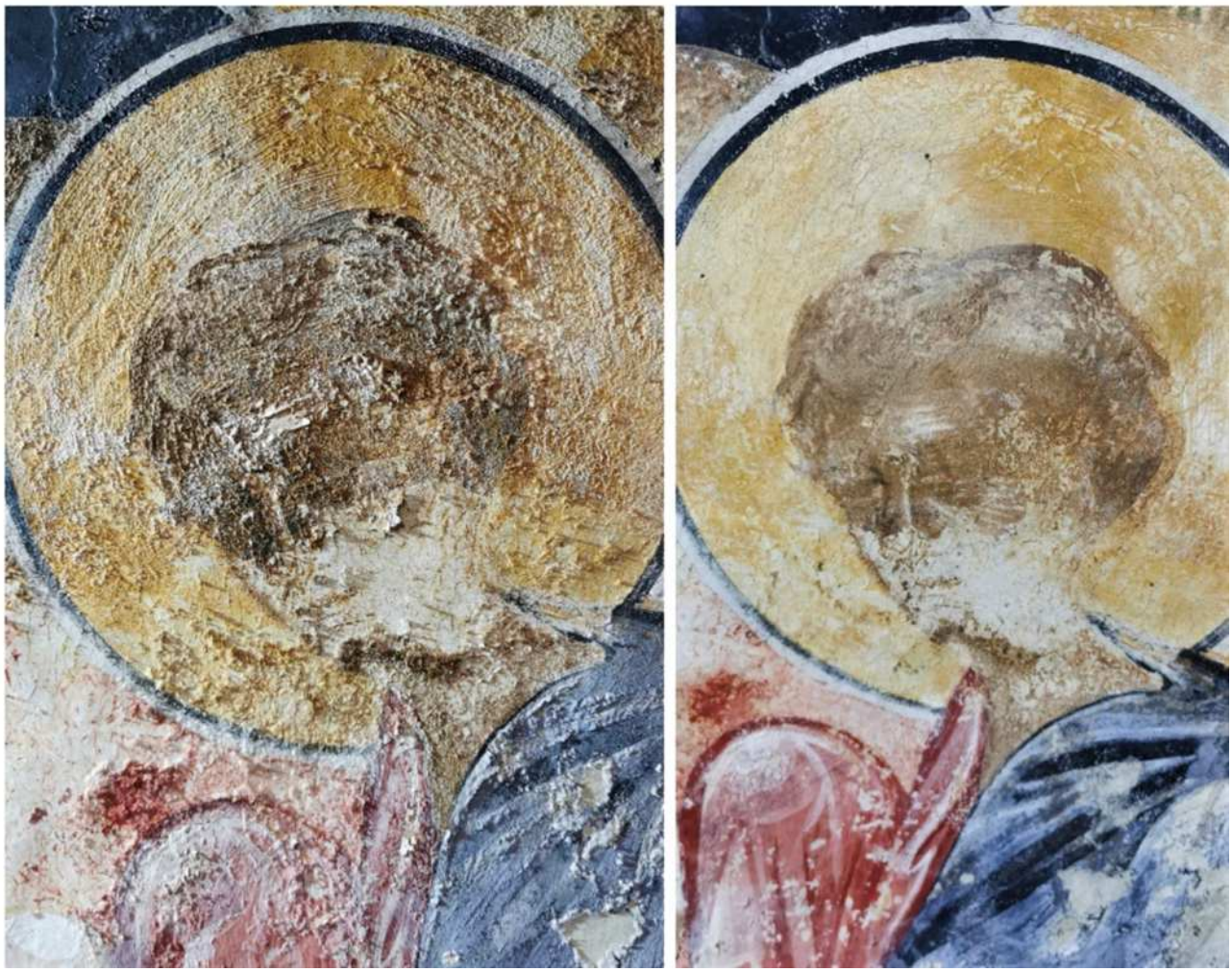

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