

MOSAIC

Compiled by Anna Minardo

TARSIA with coloured marbles and glass "Biga of a roman consul" IV a.d. Roma "palazzo del Drago"



MOSAIC

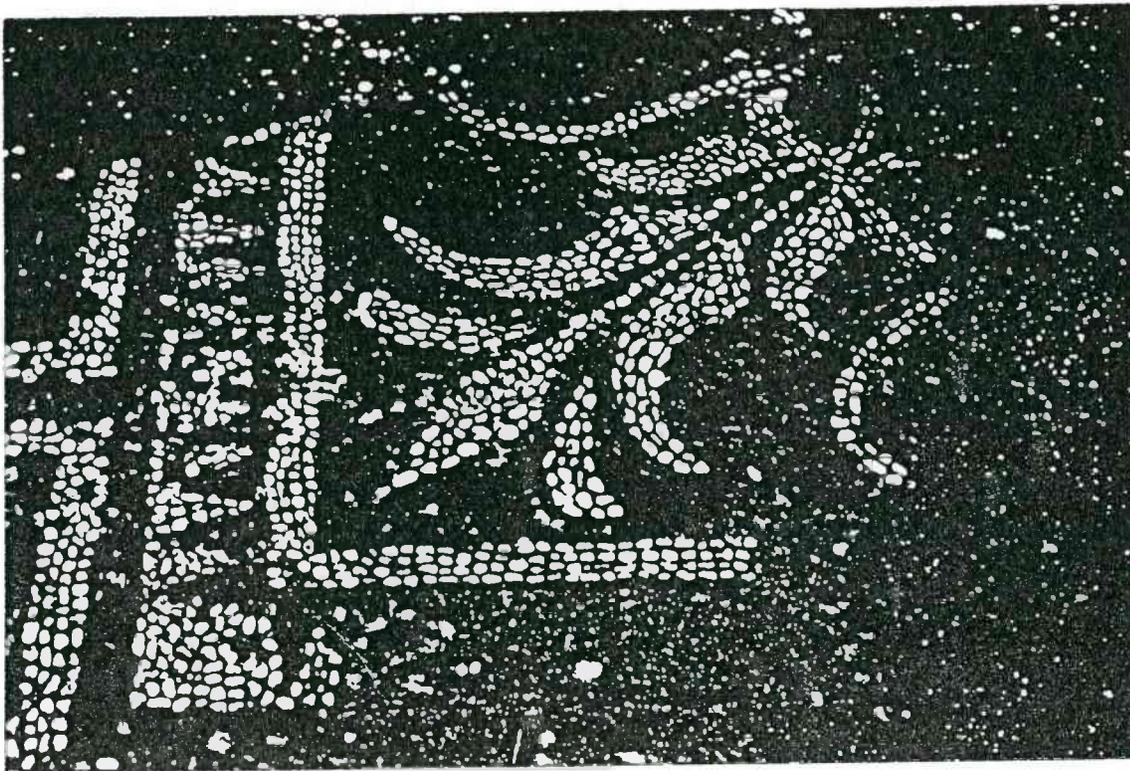
Mosaic is the art of decorating a surface with designs made up of closely set, usually variously coloured small pieces of material such as stone, glass or ceramic. Mosaic pieces, called *tesserae* (Latin for "cubes" or "dice"), are applied to a surface which has been prepared with an adhesive, either mastic or plaster. This technique is usually employed to decorate walls, floors or vaults.

F.M. from Waage 1982, 462-463

PEBBLE MOSAIC

Geometric or figured floor mosaic composed of polychrome natural pebbles closely set into a thick mortar bed, occasionally coloured to match with the decoration. The earliest known figural mosaics date back to the 5th century B.C. In the most refined ones the outlines and the details of the figures are rendered with thin strips of lead or terracotta.

F.M. from Mosaics 1966, 33-34



Opus Segmentatum Pebble Mosaic

TRANSPARENT MOSAIC TRANSLUCENT

This type of technique boldly combines the fragmented nature of mosaic with the brilliance and transparency of the stained glass medium. Mosaic units formed of transparent or translucent glass may be cut into regular shapes similar to tesserae or in free forms reminiscent of stained glass sections. The pieces are then assembled and held together either by a cement, lead or epoxy resin frame. They may also be applied with a transparent adhesive to a glass base so that they can be viewed against the light. Mosaic panels may be used as window panels, glass doors or walls.

(F.M. from Haswell 1973, 179-180; Goodwin 1985, 112; Fischer 1971, 125)

"RUSTIC" MOSAIC (F.M.)

Wall or floor decoration made up of pebbles, glass, shells and limestone drippings, used to embellish artificial grottoes, fountains and gardens from the 16th to the 18th centuries. This type of mosaic has its origin in the ancient Roman decoration of nymphaea and niches dedicated to the Muses, which consisted of shells, pumice, marble chips and coloured glass paste.

F.M. from Toesca 1934, 83; Sear 1976, 231-234

MOSAIC SCUPLTURE

Sculpture decorated with the application of mosaic tesserae or any other type of ornamental material.

F.M. orig. transl.; Fischer 1971, 8

PREFABRICATED MOSAIC

This term is usually employed for mosaic panels manufactured in the workshop by means either of the direct (b or c), the indirect or the double reverse method and then applied to the surface in situ. If at the mosaic is of large size, it may be cut up into small irregularly shaped sections which are then numbered and assembled in situ, to give the final composition. The term may also refer to emblemata.

F.M. from Johnson 1987, 7-8; Haswell 1973, 145

COMMERCIAL MOSAIC

Mosaic made up of manufactured tiles of glass (vitreous mosaic) or sintered glass (sintered mosaic), supplied in standard size (usually 2 x 2 cm.) They are intended as wall cladding or floor surfacing, (in kitchens, bathrooms, swimming pools) and are stuck to sheets of paper to be used as manageable units (usually 30 x 30 cm.). At the site, the paper is stripped of after the backs of the

site, the paper is stripped of after the backs of the tesserae have been applied to the plastered surface: it is, in fact, a mechanised version of the indirect method of application. Alternatively the tiles may be glued face-up on the perforated paper sheets. In this case, the mosaic sheets are applied to the wall by means of the direct method of application.

F.M. from Goodwin 1985, 28; Fischer 1971, 144-145; ITALMOSAIC

COSMATI WORK

COSMATI

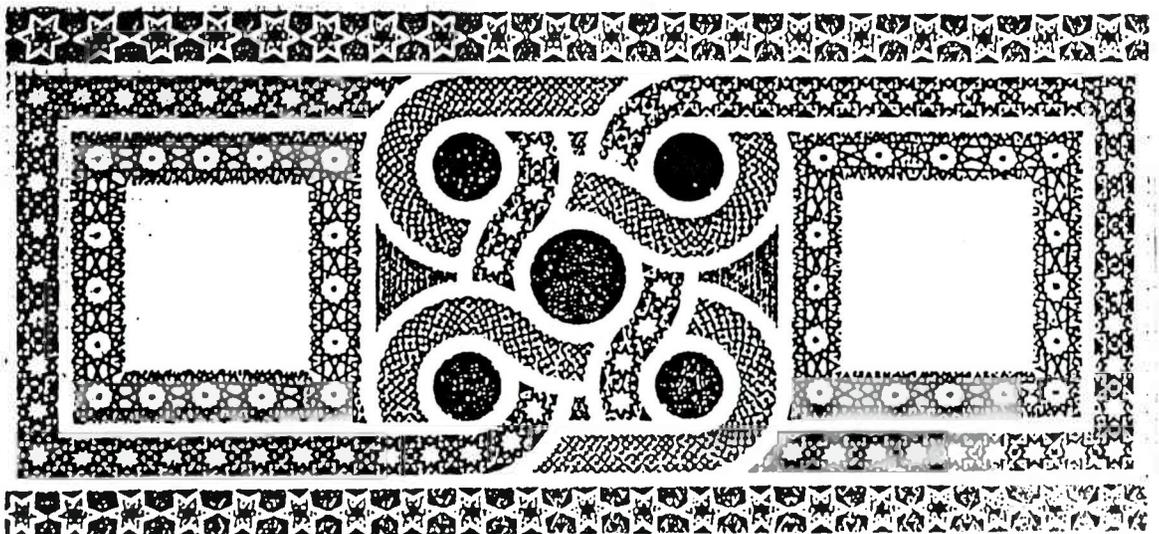
COSMATESQUE STYLE

COSMATINE

OPUS ROMANUM

The term "Cosmati work" derives from the name of a family of marbleworkers - the Cosmati - active in Rome and throughout Latium during the 12th and 13th centuries, who decorated churches with pavements, portals, cloisters, ciboria, etc. Cosmati work has its origin in opus alexandrinum and is characterised by a rigid geometric pattern: roundels of red porphyry and green serpentine are surrounded by white marble bands alternated with mosaic bands which are made up of triangular or square tesserae arranged in repetitive patterns, usually star shaped.

F.M. from Haswell 1973, 450-47; Fischer 1971, 80; Rossi 1970, 88; Goodwin 1985, 155; Glass 1980, 1-2

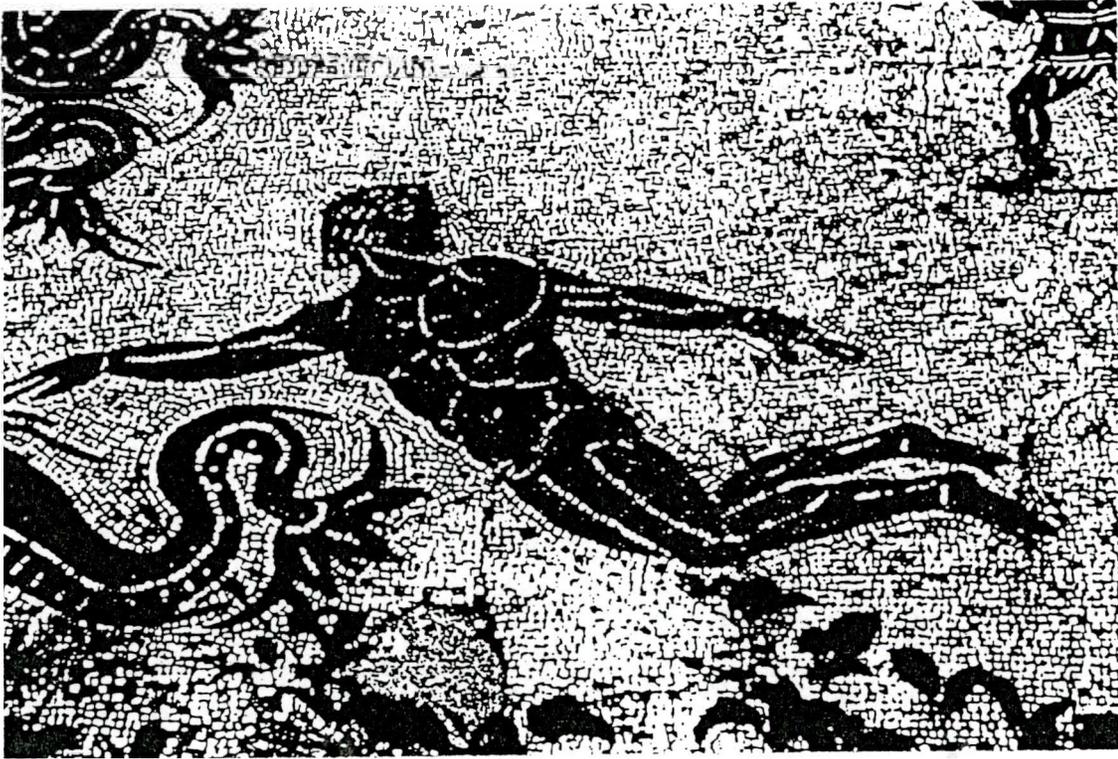


Opus Romanum Cosmati

BLACK AND WHITE MOSAIC MONOCHROME

Roman floor mosaic in opus tessellatum, made up of black and white tesserae, to be found particularly in Italy from the 1st century B.C. to the 4th century A.B. This kind of mosaic is also referred to as "silhouette" mosaic (Kitzinger, Blake) or "black-figured" style (Mosaics) since the figures are set in black on a white ground.

F.M. from Clarke 1979, 61; Kitzinger 1977, 52; Blake 1936, 138; Mosaics 1966, 38



Opus Tessellatum Black and White Mosaic

FLORENTINE MOSAIC INTARSIA

Commeso work in hard stones used decoratively in architecture and in particular applied to furniture and small objects. This technique developed in Florence and was immensely popular in the 16th and the 17th centuries. A distinctive feature of this type of commesso work is the careful choice and exploitation of the natural markings and hues of hard stones in order to have particular pictorial effects in mainly figured or floreal compositions. From the 16th to the 18th centuries the term commesso work was preferably used instead of its synonym inlay, later on, however, it began to fall into disuse.

F.M. from Rossi 1970, 117; Anthony 1935, 31; Boger 1957, 364; Fischer 1971, 8

MOSAIC GLASS CANES

In glass-making, a type of work in which coloured or multicoloured rods of glass are cut into thin slices. These sections are then arranged in a pattern on a surface and coated with a layer of transparent glass. Objects produced in this technique are also known as "millefiori glass" and look like polichrome mosaics.

F.M. from Webster 1971; Harden 1967, 29-34; Stribling 1966, 239

CERAMIC MOSAIC TILE-MOSAIC

Wall facing made up of glazed ceramic tiles (faience) of different colours and shapes, characteristic of Islamic art decoration.

F.M. from Fischer 1971, 79-80, 145; Vogel 1920, 6-8

SINTERED MOSAIC SINTERIZED

Sintered vitreous mosaic, extremely tough and durable, non-absorbent, resistant to acids and alkali and therefore widely used for floors in public buildings with heavy wear. It is produced by means of a sintering process, that is by heating at a high temperature the previously ground-up and compressed glass. This type of mosaic is supplied in various colours and sizes (round 18mm. 0, square 20 x 20 mm.) and is mainly used in commercial mosaics.

F.M. from McGraw-Hill 1980; Brooks 1976, 311; ITALMOSAIC

COMPUTERIZED DESIGN

In computerised design, the original pattern is scanned and then processed by the computer which transforms each point into a small square corresponding to one mosaic tile. Any detail may then be modified by enlarging the image on the monitor. A total of 4,096 colour shades can be obtained but the range is then reduced to the 80-100 shades actually manufactured in commercial mosaics. Finally the printer produces the detailed mosaic. This technique is being increasingly employed because the resulting mosaic product may be examined before the manufacturing process begins, and also because time and production costs may be reduced.

F.M. from ITALMOSAIC

GOLD OR SILVER LEAF FOIL

In gold and silver smalti the thin metal foil (of gold, silver, or recently, of platinum) embedded between two layers of colourless and sometimes coloured glass; one acts as a base, the other as a protective film (cartellina).

F.M. from Fischer 1971, 144

COLOURING AGENT PIGMENT

In the manufacturing of smalti, a substance added to the molten glass paste to impart the desired colour to the final product. It usually consists of a mix of metal oxides and salts.

Fischer 1971, 142

A substance used to impart colour to limestone-based binders: either white or coloured marble dust, brick dust or various types of coloured sands and earths may be added to the mortar mix.

Goodwin 1985, 156

OPUS

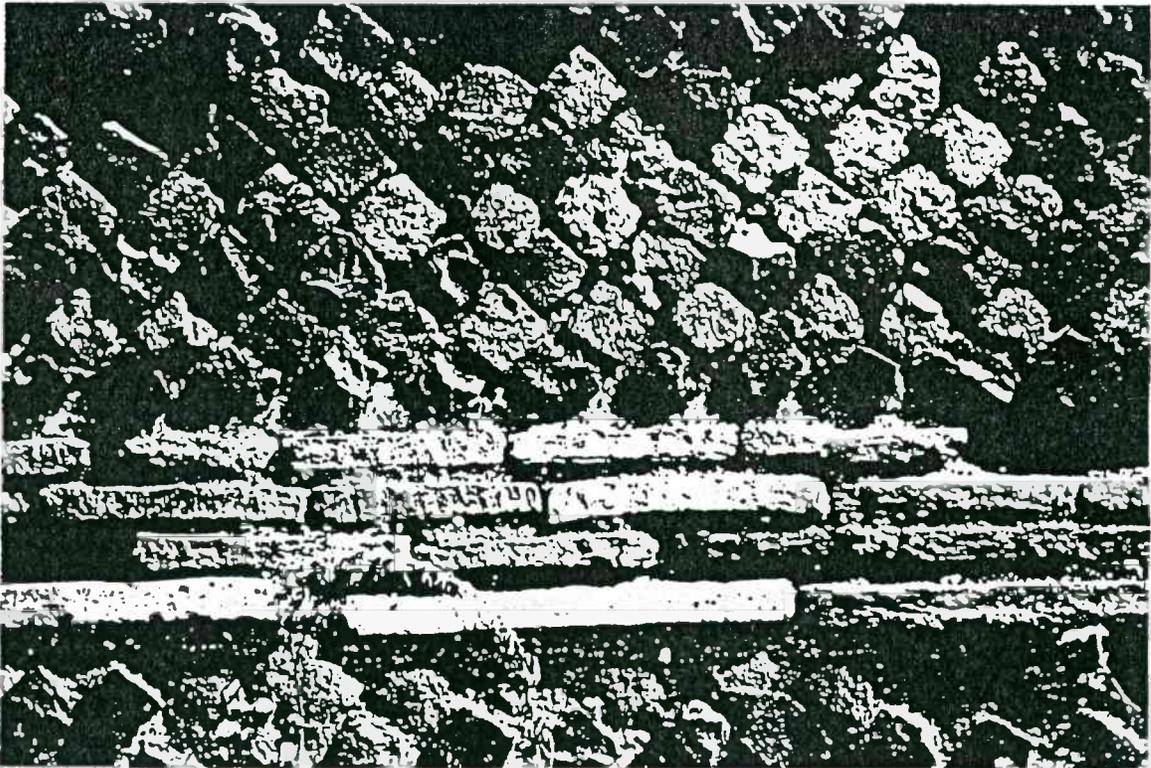
Piazza Armerina Villa Imperiale "Ammore e Psyche"



OPUS (PL. -OPERA)

"(Literally "work"); in Roman architectural terminology, a type of wall or floor construction, usually defined by its superficial facing or covering.

Henig 1983, 2-53



Opus Reticulatum

OPUS SCALPTURATUM
- SCULPTURATUM

A pavement in opus scutulatum, that is composed of lozenge-shaped pieces (scutulae; the old lesson scalpturatum found in the old editions of Pliny's work is to be rejected).

(F.M. orig. transl.)

A type of floor mosaic in which the outlines of the tesserae are marked with a kind of dark-coloured mastic.

F.M. orig. transl.

OPTUS RETICULATUM

In Roman masonry, wall facing of small stone blocks in the shape of truncated pyramids, set diagonally (45°) in mortar to form a net-like pattern.

F.M. from Henig 1983, 253

OPUS VERMICULATUM (pl. - TA)

(modern term, not found in ancient texts, however, currently used by scholars for the sake of convenience. In classical Latin authors the adjective "vermiculatus" is combined only with *emblema*, *crusts*, *pavimentum*.

F.M. from Dunbabin 1979, 267

Technique employed in the execution of the most refined mosaics (*emblemata*). The term "vermiculatum" - from the Latin "vermiculus", little worm - refers either to the tiny worm-like tesserae (from 1 to 4mm) no longer square but irregular in shape, or to the wriggling following of shapes by flowing lines of small tesserae.

F.M. from Blake 1930, 128; Fischer 1971, 148



The term vermiculatum does not refer to the technique employed in a particular kind of mosaic, but is used to indicate the chromatic effects of polychrome tesserae, meaning "variegated", "multicoloured". Emblemata were therefore made in the opus tessellatum technique employing small tesserae (*tesserulae*).

F.M. orig. transl.

OPUS SIGNINIM (P1. -NA)
COCCIOPESTO

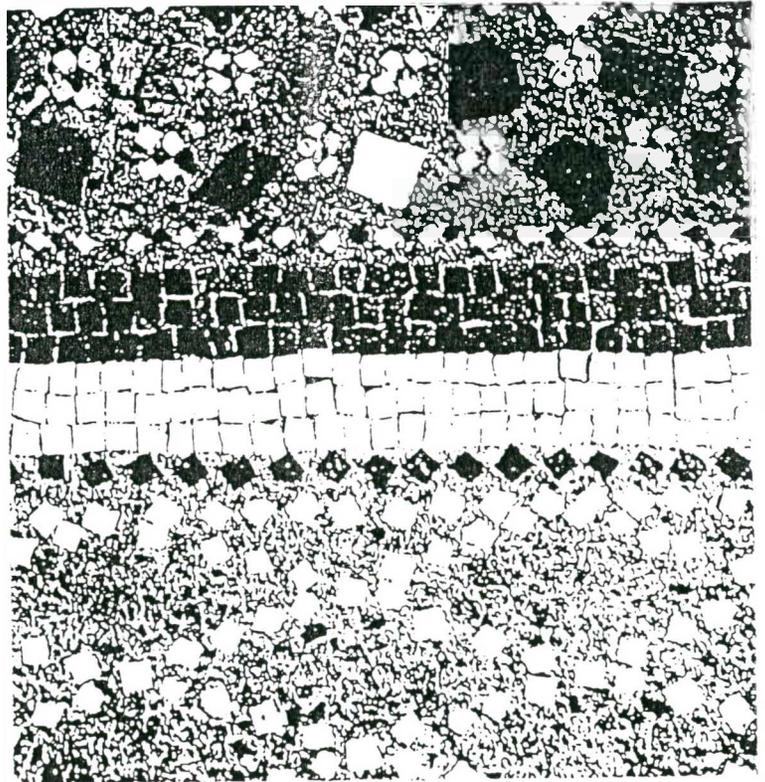
(from Signae - now Segni - a town in Lazio renowned for the deep red-coloured compound of crushed pottery mixed with lime. Opus signinum could serve a utilitarian as well as a decorative purpose: it could be employed in cisterns, pools, and rooms where a hard, firm, and watertight surface was required or it could serve as a simple flooring in subordinate rooms. In this case, limestone tesserae or marble chips were often inserted in a simple geometric pattern.

F.M. from Fernandez 1982, 238, 242

The term "opus signinum", usually refers both to red and white coloured beaten floors.

(F.M. orig. transl.

Opus Signinum



OPUS TESSELLATUM
PAVIMENTUM TESSELLATUM
TESSEL(L)ATED PAVEMENT
(from tessella, "small tessera", "little cube". F.M. orig. translation.)

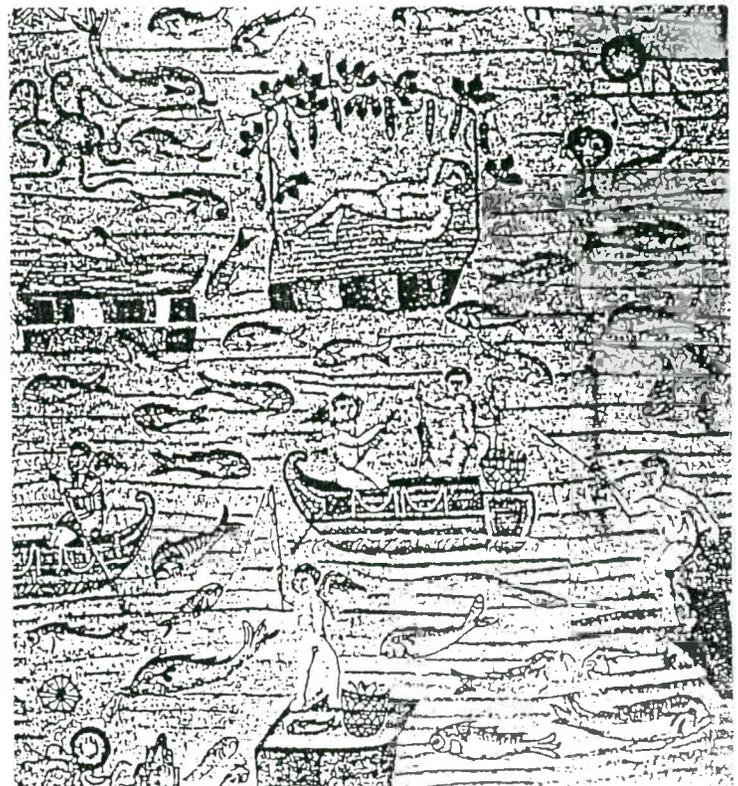
All types of floor mosaics i.e. monochrome or polychrome, geometric or figurative, made with tesserae, cubes of stone or marble if fairly course size, up to 2 cm. square.

(F.M. FROM SMITH 1983, 116)

The laying of tesserae in orderly straight lines, usually horizontal. Used particularly for neutral backgrounds or simple ornaments.

Goodwin 1985, 156; Fischer 1971, 147

Opus Tessellatum



OPUS SCUTULATUM (pl.-TA)
PAVIMENTUM SCUTULATUM

A pavement in opus sectile made up of tiles in various geometric shapes (squares, triangles, hexagons and lozenges). The pattern made up of lozenges in three different colours, resembling cubes seen in relief, was only the most refined type.

F.M. orig. transl.

A type of sectile pavement, composed of lozenges (scutulae) in three different colours, laid to give the impression of cubes seen in relief.

Blake 1930, 35-36

COCCIOPESTO

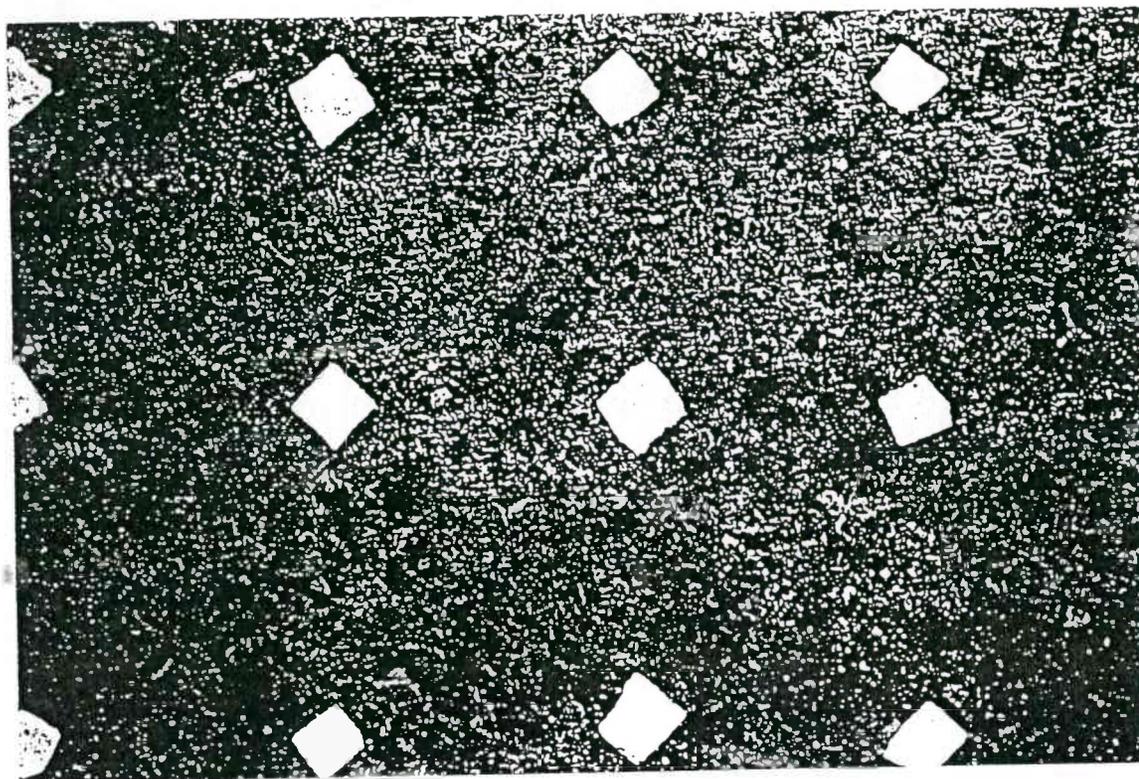
COCCIOPISTO

(comp. of coccio, "a peice of terracotta, baked clay" and pesto, past part. of the verb pestare, to pound, to break into tiny fragments".

Rossi 1970, 182.

Cocciopesto was used as a filler to be mixed with lime in order to obtain a red-coloured, water-tight material. This compound was used either directly as a pavement (opus signinum), or as a foundation in which tesserae were set to make a mosaic floor.

F.M. from Rossi 1970, 182-183; Smith 1983, 137; Blake 1930, 24



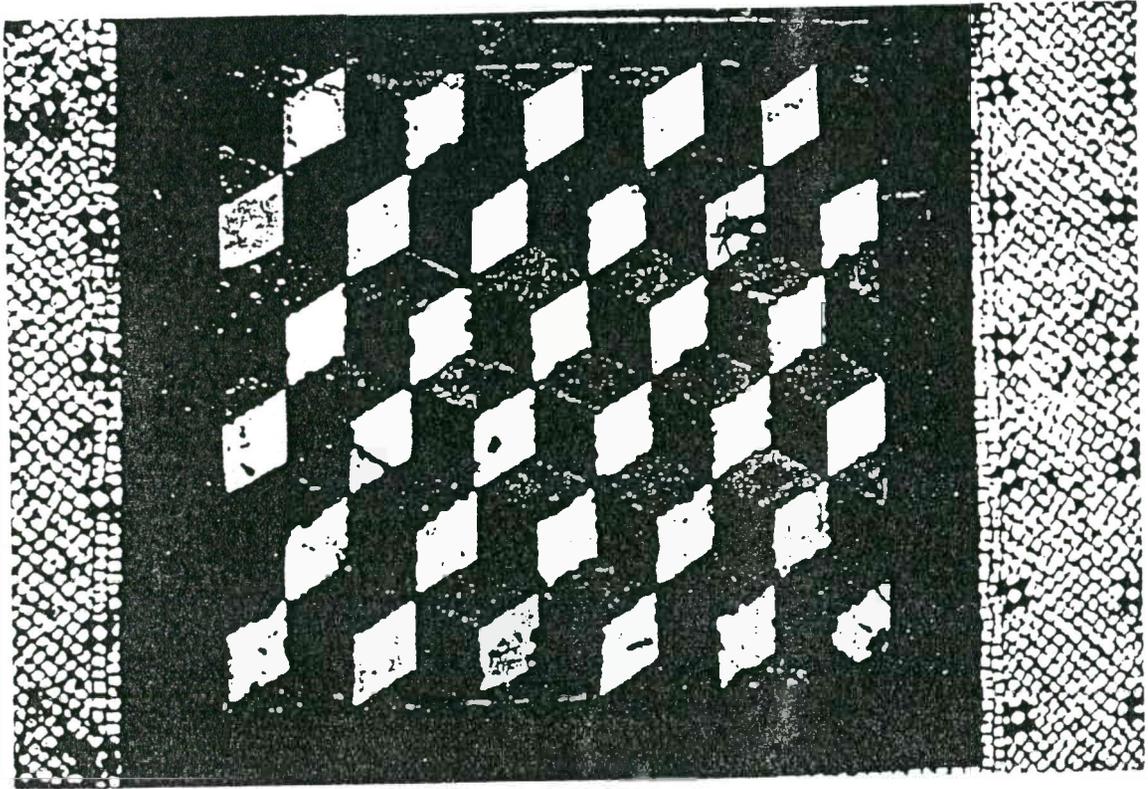


Fig. 13 OPUS SECTILE

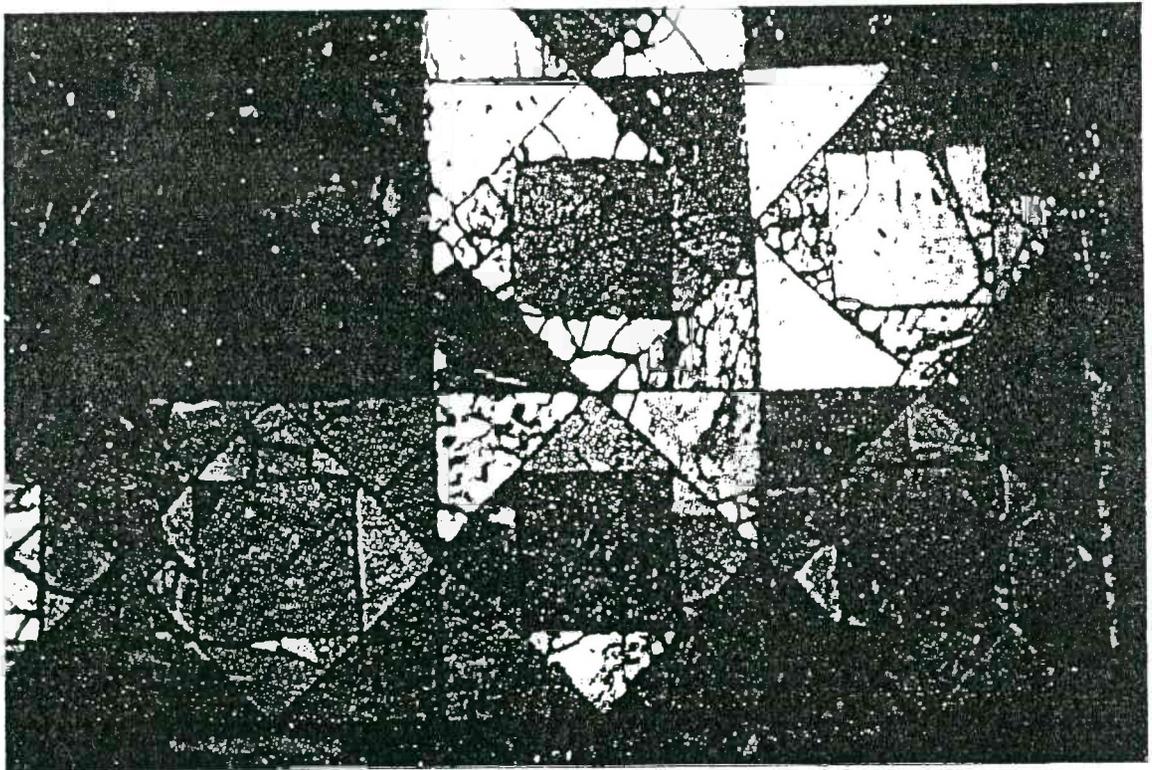
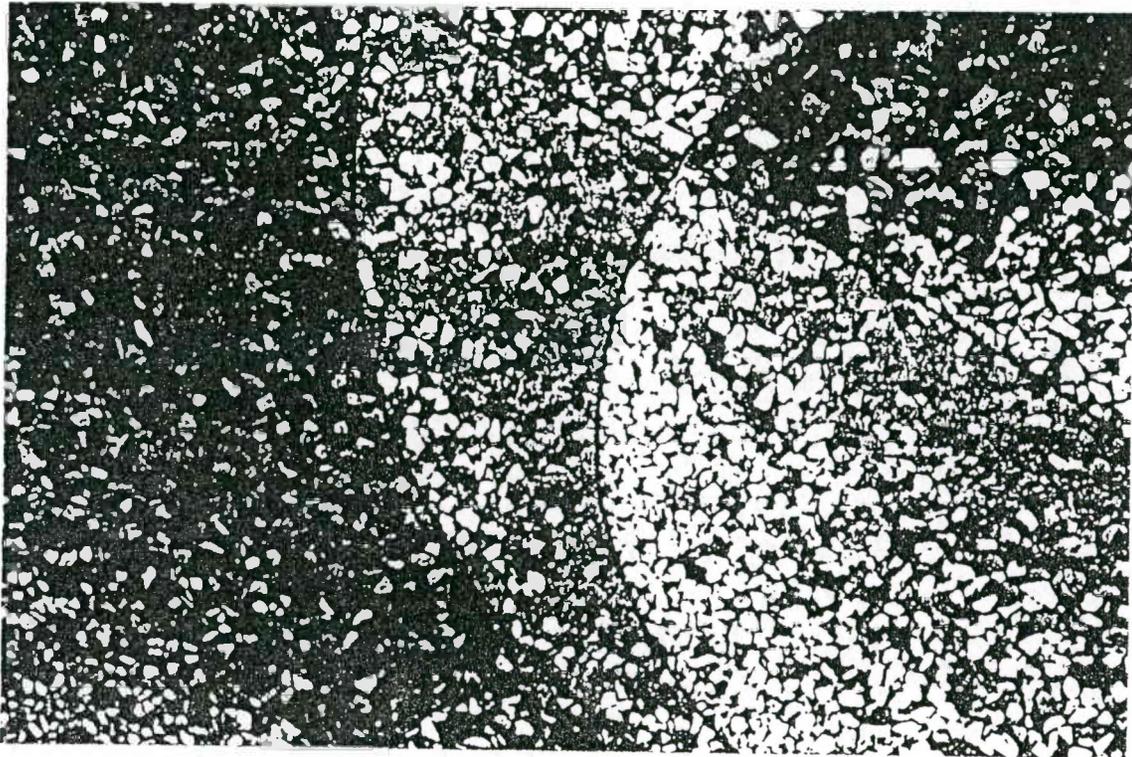


Fig. 12 OPUS SCUTULATUM (43)



TERRAZZO

Flooring in which chips of marble are scattered at random ("sown", *seminato*) or arranged to form simple linear patterns on a cement matrix. On setting the surface is ground smooth to show a cross section of the chips through the mixture. This type of floor decoration came to be very popular in the region of Venice, particularly in the 18th and 19th centuries.

(F.M. from FISCHER 1971, 148; GOODWIN 1985, 24, 157)

INLAY
INTARSIA
MARQUETRY

Decorative technique in wood or stone (marbles, hard stones) in which pieces of different colours and equal thickness, cut into shape according to the desired design, are attached to a support. Synonymous with commesso work. In particular, wood inlay is usually referred to as intarsia.

F.M. from Haswell 1973, 42-43; Blake 1930, 47-48; Goodwin 1985, 18

OPUS SPICATUM (pl.-TA)

Floor covering in which stone or marble strips are laid in herring-bone pattern, like the grains in an ear of corn (spica). Bricks (testae) were rather employed to pave courts, passage-ways and open-air terraces. In this case the pavement was called spicatum testaceum.

(F.M. from Moore 1968, 57)

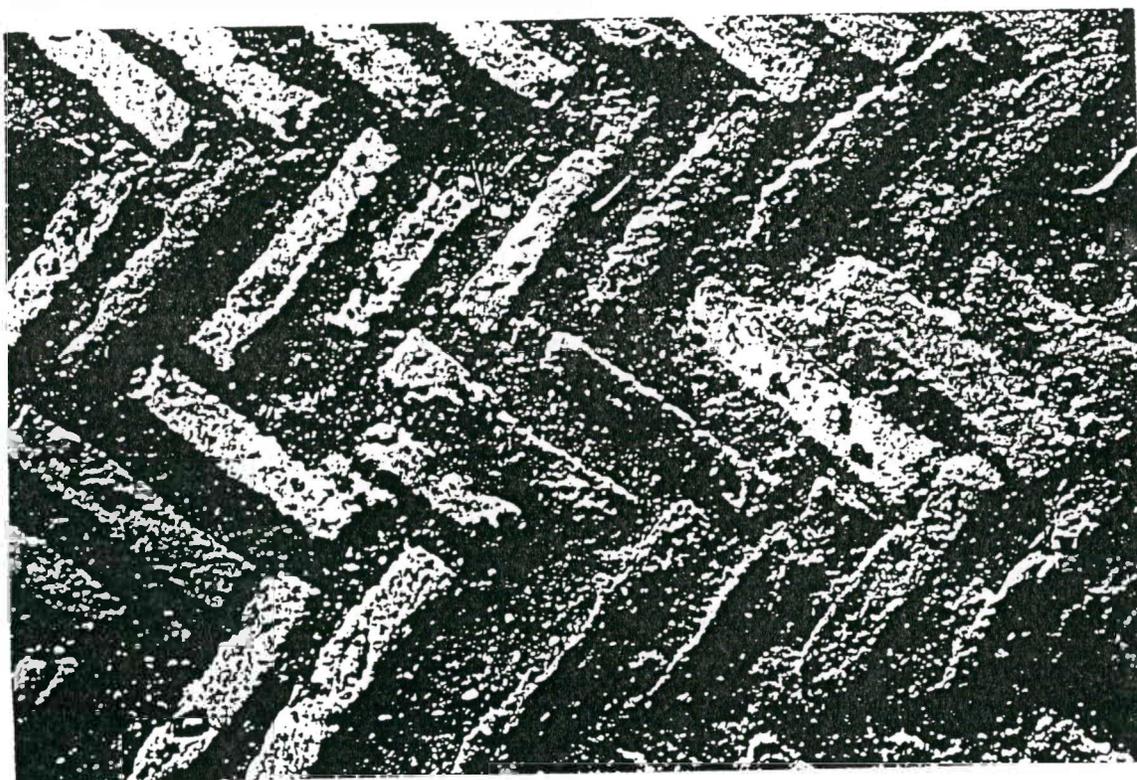
OPUS VERMICULATUM (pl. - TA)

(modern term, not found in ancient texts, however, currently used by scholars for the sake of convenience. In classical Latin authors the adjective "vermiculatus" is combined only with *emblema*, *crusts*, *pavimentum*.

F.M. from Dunbabin 1979, 267

Technique employed in the execution of the most refined mosaics (*emblemata*). The term "vermiculatum" - from the Latin "vermiculus", little worm - refers either to the tiny worm-like tesserae (from 1 to 4mm) no longer square but irregular in shape, or to the wriggling following of shapes by flowing lines of small tesserae.

F.M. from Blake 1930, 128; Fischer 1971, 148



Opus Spicatum



Fig.16

TARSIA INTALNA

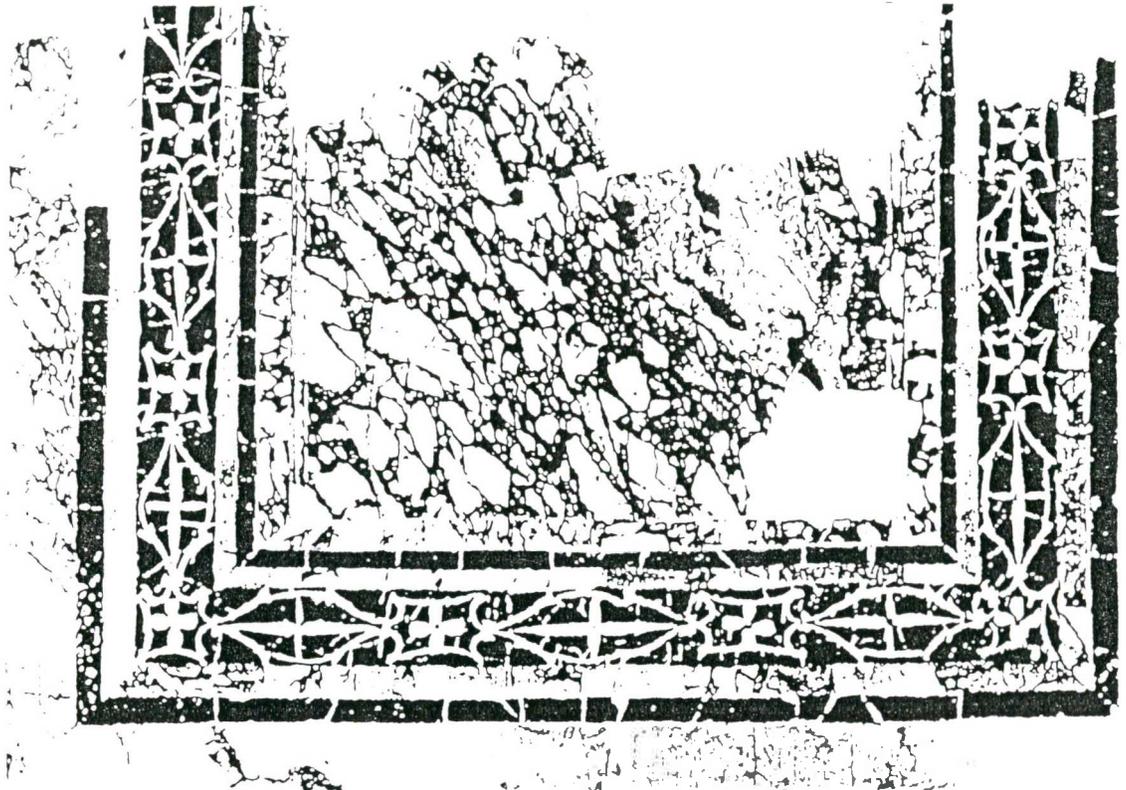


Fig.17

EMBLEMA (pl.-TA)

Figured mosaic panel, usually of small size (1x1m.), worked separately in workshop either on a slab of marble or in a terracotta tile with raised edges as a frame. Emblemata were then inserted into floor or wall mosaics made on the spot with a simple geometric pattern in tessellatum or sectile work. Such panels were executed with refined workmanship (*opus vermiculatum*) in the style of painting or directly imitating actual paintings by means of minute tesserae (up to 50 per cm²) in the widest possible range of colours.

(F.M. from Neal 1976, 241, Smith 1983, 117)



OPUS INCERTUM

In Roman masonry, irregular wall-facing of small rubble set in mortar. (*opus caementicium*).

(F.M. from Henig 1983, 253)

SMALTI (p1.-I)
GLASS MOSAIC
BYZANTINE GLASS MOSAIC
VENETIAN -
ARTISTIC -
ENAMEL

THE TERM "smalti" refers to opaque coloured vitreous paste from which tesserae for wall mosaics are obtained. Smalti are basically ordinary glass with metal oxides added as opacifying the colouring agents. The mixture is fused at about 1300°-1500°C. and the molten mass is then pressed flat to form the characteristic circular glass discs known as "pizze" which are eventually broken up into tesserae after cooling. Smalti are unique as mosaic material for, besides being weather resistant and easy to cut, they also offer incomparable brilliance and reflective power. This choice of colours is almost unlimited (28.000) and they vary according to the type of material oxides used and the melting temperature.

(F.M. from Fischer, 1971, 142-143; Haswell 1973, 71-72; Stribling 1966, 39; Demus 1948, 12-13)

GOLD and SILVER SMALTI
METALLIC SMALTI
GOLD MOSAIC
- GLASS
GUILT -

Gold smalti are not coloured throughout, but consists of three strata. The top one is a very thin glass film (cartellina) which serves to protect the second stratum, a leaf of gold, silver or platinum. A thick layer of ordinary glass (5-7mm.) acts as a base and makes up the depth of normal tesserae. The metal leaf is therefore sandwiched between two layers of glass which may be coloured so as to have various types of gold tesserae.

(F.M. from Haswell, 1973, 67, 72; Fischer 1971, 144; Smith 1983, 135)

MASTIC

A glasslike yellow resinous exudation of the mastic tree (*Pistacia lentiscus*). Used as a mosaic binder in ancient Greece and the Byzantine time.

(F.M. from McGraw-Hill 1980; Fischer 1971, 141)

Adhesive binder made of a mix of various substances. In mosaic-making a mastic made of cement, cold-setting glue and water is used particularly in the direct method (b) of application.

(F.M. from McGraw-Hill 1980; Fischer 1971, 141)

VINYL RESIN

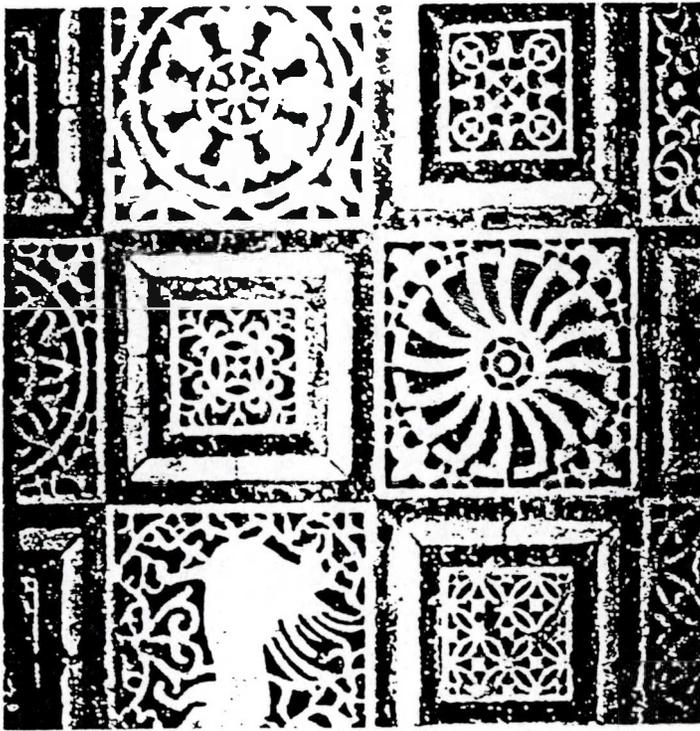
A thermoplastic material resulting from the polymerization of vinyl chloride and vinyl acetate. In mosaic, a binder obtained by mixing a vinyl acetate emulsion with sand, brick and marble dust is frequently used.

(F.M. orig. transl.)

OPUS INTERRASIBLE

Wall-facing technique in which thin sections (1cm.) of polychrome, or other decorative material, are inserted into a white marble slab of greater thickness (4-8 cm.) and fixed to it with a warm paste of powdered marble and rosin. The borders and other parts of the base slab are visible and form part of the pattern.

(F.M. orig. transl.; Haswell 1973, 42)



Opus Interrasibile

PASTE, GLUE, PUTTY, STONE MATERIALS

AVENTURINE

A particular type of glass paste containing sparkling gold coloured particles, usually copper or chromic oxide. Vitreous mosaics containing aventurine have a fine gold grain on the surface. They are exclusively employed as wall decoration.

(*F.M. from McGraw-Hill 1980; ITALMOSAIC*)

BITUMINOUS GLUE

Organic, naturally occurring binder consisting of a non-crystalline, solid or semisolid mixture of complex hydrocarbons derived from petroleum deposits through evaporation of volatile oils. Used by the Sumerians as a binder for mosaics on a wooden base.

(*F.M. from Davey 1961, 128; Haswell 1973, 62*)

LIME PUTTY

A white putty-like mixture made by mixing quicklime and water in proportions of 56 parts of quicklime and 54 parts of water, or by adding the required amount of water to hydrated lime. The product, after seasoning, is therefore plastic and therefore, easily workable. Today in mosaic-making it is used mixed with sand as a temporary binder in the double reverse method of execution.

(*F.M. from Brooks 1976, 234; Fiorentini 1971, 156*)

STONE MATERIAL

General term comprising those natural materials as rocks and materials which are used to make mosaic tesserae. (*Haswell 1973, 111*)

MARBLE

A metamorphic rock, mainly composed of calcium carbonate (CaCO_3) and crystalline in structure that is originated from a sedimentary limestone which has been altered by heat or pressure metamorphism. It has always been extensively used as a decorative building stone and in particular as a mosaic material because it can be easily worked and cut into tesserae. A wide variety of colour and veining can occur in marble: from black, yellow and brown to green, red and pink, depending on the presence of various materials; white marbles are composed of pure calcium carbonate.

(*F.M. from Hawswell 1973, 112; Whittow 1984, 325*)

HYDRAULIC MORTAR**POZZOLAN CEMENT . POZZOLANA MORTAR****POZZOLAN (A)**

A mixture of pozzolana or any other pozzolanic material (brick dust, cocchiopesto), sand and slaked lime. Pozzolanic materials impart to the mix hydraulic properties and greater strength because they possess the requisite compounds of silica and alumina which will combine with nonhydraulic limes at ordinary temperatures in the presence of moisture to form stable insoluble compounds of cementitious value such as calcium silicates and aluminates. This type of hydraulic mortar was the only one known to the Greeks and Romans and was extensively used up to the 18th century when it was superseded by hydraulic limes and later on by cements.

(*F.M. from Davey 1981, 102-103; Brooks 1976, 102; Haswell 1973, 55; McGraw Hill 1980*)

GYPSUM PLASTER

A non-hydraulic binder which has been used since ancient times. It is made by calcining gypsum rock ($\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$) at a temperature between 130° and 300°C . At about 170°C , 75% of the chemically combined water is driven off and a material known as "plaster of Paris" or "hemihydrate plaster ($\text{CaSO}_4 \cdot \frac{1}{2}\text{H}_2\text{O}$)" is formed. This product sets very rapidly when mixed with water and is preferably used for indoor works and in dry climate because it does not resist moisture. If burned at a temperature between 170° and 300°C , all the water in the gypsum is driven off and anhydrous calcium sulphate (CaSO_4) is formed.

This product sets rather slowly when mixed with water and is mainly used in conservation to make casts of mosaic surfaces.

(*F.M. from Davey 1961, 92-93*)

BITUMINOUS GLUE

Organic, naturally occurring binder consisting of a non-crystalline, solid or semisolid mixture of complex hydrocarbons derived from petroleum deposits through evaporation of volatile oils. Used by the Sumerians as a binder for mosaics on a wooden base.

F.M. from McGraw-Hill 1980; ITALMOSAIC

ENAMEL GLAZE

Glass-like substance used for coating metal and porcelain for decoration or as a protection. It is obtained by grinding coloured glass into a fine powder which is then mixed with water and applied with a paint brush to the surface to be decorated. The glassy coating adheres to the support while it is being remelted in the kiln.

(F.M. from Oxford 1985)

ACRYLIC RESIN

A thermoplastic synthetic polymer resulting from the polymerization of acrylic acid, methacrylic acid and other derivatives. In mosaic a product called PRIMAL AC 33, is commonly used. When mixed with sand, brick and marble dust, an emulsion of this product produces a mosaic binder of limited resistance, used for mosaics to be placed indoors.

(F.M. orig. transl.)

EPOXY RESIN

A thermosetting synthetic material resulting from the polymerization of monomers with epoxide groups. Epoxy resins have high strength and excellent adhesive properties: when mixed with quartz sand, an emulsion of these products produces a very strong mosaic binder.

(F.M. orig. transl.)

SYNTHETIC RESIN

Organic solid material of high molecular weight (polymer) derived from the bonding (polymerization) of a great number of simple molecules (monomers). Depending on the polymer's structure, either one- or three-dimensional, synthetic resins properties vary considerably: thermoplastic resins will repeatedly soften when heated and harden when cooled; thermosetting resins solidify when first heated under pressure, but cannot be remelted or remolded without destroying their original characteristics. In mosaic the resins commonly used as binders are acrylics, epoxies and vinyls.

(F.M. from McGraw-Hill 1980)

STUCCO

A binder, also known as oil mastic, invented by Muziano da Bescia (1528-1592) but probably already used in Roman times. It consists of a mixture of powdered travertine, slaked lime prepared from travertine, raw and boiled lin seed oil. This binder has the advantage of slow drying but also the disadvantage that stone tesserae tend to absorb the oil and to become discoloured. Therefore its use is limited to glass mosaics and in particular to those made with smalti filati.

(F.M. from Jenkins 1957, 62; Fischer 1971, 141; Haswell 1973, 59-60)

TERRA SIGILLATA

SAMIAN WARE

Fine red glazed pottery in general use over the Roman Empire. In antiquity, fragments of samian ware were a useful source of red for mosaic tesserae.

(Oxford 1949; Neal 1976, 42; Henig 1983, 253)

STAINED GLASS

TRANSLUCENT GLASS MOSAIC -

STAINED GLASS

Ordinary, non-opaque coloured glass obtained by the fusion of a mix of silica, alkalines, lead oxide as a flux and metal oxides as colouring agents at about 1200°-1300°C. In mosaic decoration stained glass tesserae are preferably set on transparent or reflective bases in order to maintain their brilliant colour.

(F.M. from Jenkins 1957, 9, 26; Fischer 1971, 145)

VINYL

A thermoplastic material resulting from the polymerisation of vinyl acetate. In mosaic, a binder obtained by mixing a vinyl acetate emulsion with sand, brick and marble dust is frequently used.

F.M. orig. transl.

PLASTER

A mixture of cement, sand, lime putty and water which, when freshly mixed, can be applied in thin layers over a support and which hardens to form a rigid surface. It is used mainly as a wall coating and serves as a binder for mural mosaics.

(*F.M. from Brooks 1976, 271; McGraw-Hill 1980*)

GROUT SLURRY

A fluid mixture of binder (cement or lime), fine sand or marble dust and water, used in mosaics to fill the interstices between tesserae (grouting). In particular, in conservation, grout is used as adhesive material to be injected behind the tesserae layer to allow consolidation of weak and fractured mortars.

(*F.M. from Haswell 1973, 234; Goodwin 1985, 37-38; Ferragni 1983, 84; Johnson 1987,7*)

POZZ(U)OLANA POZZOLAN

POZZOLANIC MATERIAL

(from the Latin Puteolanus pulvis, "Pozzouli ash", the locality near Naples, from which it was obtained. Davey 1961, 103)

Volcanic ash found particularly in Italy, mainly composed of silica and alumina (60-70%), varying in colour from red to grey or dark brown. This material has always been extensively used to convert a non-hydraulic one: when mixed with lime mortar, the compounds of silica and alumina combine with slaked lime at ambient temperature in the presence of moisture and form stable insoluble compounds of cementitious value, such as calcium silicates and aluminates. Today it is often combined with Portland cement to obtain Portland-pozzolana cement with high water resistance.

(*F.M. from Fischer 1971, 141; McGraw-Hill 1980; Brooks 1976, 276*)

CEMENT

A hydraulic binder obtained by burning a mixture of limestone and clay or argillaceous limestone at about 1500°C. in rotary kilns. The high temperature causes the partial fusion and vetrification of the mass; the resulting clinker, a very hard material, is then finely ground and the characteristic grey cement powder is obtained. The production of this binder started only in the 19th century. Portland cement is still the most widely used type of binder, therefore, the word cement nearly always means "Portland cement".

(*F.M. from Brooks, 1976, 101*)

HYDRAULIC LIME

Hydraulic binder which hardens under water as well as in air. It comes from argillaceous limestones or a mix of limestone and clay burnt at about 900°-1000°C. When calcined, the silica and alumina present in clay combine with calcium carbonate and form a sufficient quantity of calcium silicates and aluminates to give the characteristic hydraulic properties which vary depending on the percentage of clay present (10-20%). This binder was discovered in the 18th century; up to that time hydraulic mortars of lime and pozzolana have been used.

(*F.M. from Haswell 1973, 54; McGraw-Hill 1980*)

LIME

A binder which hardens in air but is dissolved by water, used in mosaic art since ancient times on account of its properties of good work ability and fairly good strength. The white porous substance is made by burning limestone (CaCO₃) at 800°-900°C. As a result of the loss of water, limestone changes from calcium carbonate into calcium oxide (CaO), a grayish-white powder which is also called quicklime. This substance is particularly porous and with the controlled addition of water is converted to calcium hydroxide, also called slaked lime. After being mixed with water, this substance reacts with carbon dioxide of the air and sets, forming lime (CaCO₃).

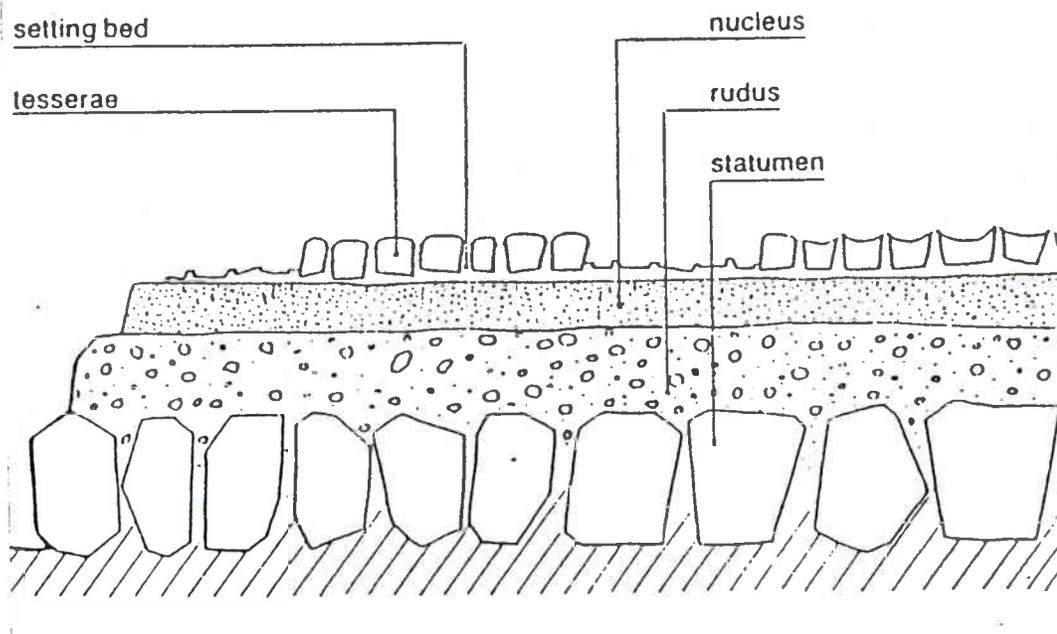
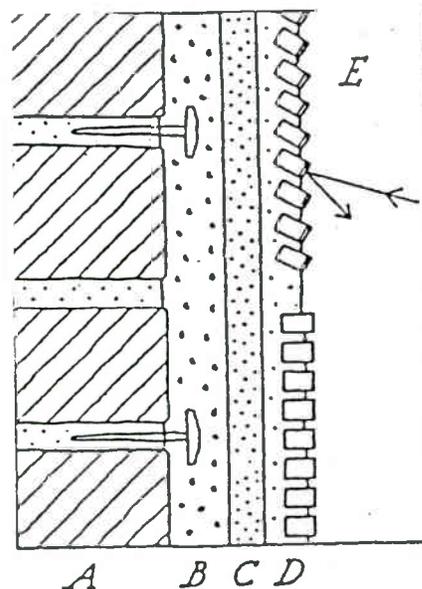
(*F.M. from Brooks 1976, 234*)

FOUNDATION BEDDING SUBSTRATUM, SUBSTRUCTURE

(Floor) FOUNDATION BEDDING SUBSTRATUM (pl.-TA) SUBSTRUCTURE

The preparation of the base is part of the technique of construction of mosaic floors, for it is the foundation which has to ensure that the finished surface can withstand weight, wetness and winter frost without warping or subsiding. In classical pavements the foundation was usually composed of four strata: stratumen, rudus, nucleus, and supranucleus, into which the tesserae were set. Today the bedding of a mosaic floor consists of two or three strata: a loose stone foundation, a cement slab and a thin layer of hydraulic binder as setting bed.

(F.M. from Fischer, 1971, 141; Moore 1968, 66; Johnson 1987, 7; Blake 1930, 17-18)



- A - muratura / brick wall
- B - primo strato di intonaco con chiodi a testa larga / first plaster coat with flat-headed nails
- C - secondo strato di intonaco / second plaster coat
- D - strato di allettamento / setting bed
- E - inclinazione degli smalti d'oro / tilting of gold tesserae

FIRST PLASTER COAT
ROUGH
SCRATCH
FOUNDATION
ARRICCIO

In ancient mosaics, the first plaster layer applied directly to the masonry to cover irregularities in the stone or brick wall. It consisted of a course mixture of one part lime putty, about three parts inert materials (sand, karble dust, pozzolana) and a certain amount of straw which favoured air circulation inside the mortar layer. This preliminary plaster coating was usually 3-4cm thick and was given a foughened surface (indations), with the trowel to provide a mechanical bond with the second plaster coat. In overhanging areas such as domes, cramps and flat-headed nails were inserted into the wall and allowed to project slightly to ensure the attachment of the screach coat to the masonry.

(F.M. from *Mosaics* 1966, 56; Davey 1961, 175; *Mosaics N. 1* 1977, 12; Haswell 1973, 8; Majewski 1977, 55)

BEDDING MORTAR
INTERVENING BED
MORTAR SUPPORT

One of the mortar layers which make up the foundation either in a mural or floor mosaic.

(F.M. from Novis 1983, 105; *Mosaics N.2* 1980, 63; Ferrangi 1983, 83)

GROUTING

When the floor mosaic has been completed, the interstices between the tesserae are filled with fine liquid mortar in order to obtain a flat and levelled finish. Then the grout has set and the mosaic is cleaned and polished.

(F.M. from Goodwin 1985, 37-38; Smith 1983, 116)

SETTING BED
BED

The thin layer of binder spread in small sections (giornate) on the surface to be decorated, into which the tesserae are set. In floor mosaics it is identified either with the nucleus (Fischer, Blake) or with the supranucleus (Moore).

nucleus (Fischer, Blake) or with the supranucleus (Moore). In outermost plaster layer. (third plaster layer).

(F.M. from Fischer 1971, 141; Blake 1930, 18; Moore 1968, 66; Smith 1983, 116)

SETTING
LAYING
BEDDING
EMBEDDING
PLACING

In the traditional direct method of application, to press the tesserae into the mortar setting bed down to 2/3 of their height. In other types of application (direct b and c, indirect) the tesserae are simply glued on to the support or paper backing.

(F.M. from Waage 1982, 464; Haswell 1973, 149)

ANDAMENTO

The "coursing" or direction of the rows of tesserae: in horizontal, circular, sinuous lines or in fan arrangement.

(Fischer 1971, 147; Bull 1976, 98)

TILTING
ANGLING

In Byzantine wall mosaics, in particular from the 6th to the 10th centuries, tesserae were not placed on the same level and at the same depth. In haloes and backgrounds gold and silver glass tesserae were tilted 30° downward or turned slightly sideways to catch the light from a nearby window. This device enhanced reflection and secured maximum light effect.

(F.M. from Waage 1982, 465)

DOUBLE REVERSE METHOD
 DOUBLE INDIRECT -
 RECIPROCAL -
 ITALIAN -
MOSAICO a RIVOLTATURA -
su STUCCO
PROVVISORIO

This method, known by the end of the 19 century, is apt for an accurate execution and a detailed design. Tesserae, are first set into a shallow bed of lime mortar, clay, plastiline or moist sand only. After the completed mosaic has dried one or two layers of gauze are applied to its surface using a water-soluble glue. The mosaic is then eased from the temporary bed (lifting), and every trace of mortar is removed from the back of tesserae. After relaying the mosaic on a new permanent setting bed, the facing is taken off with plenty of hot water. This system of application contains the advantages of both the direct and indirect methods: the tesserae are set at different angles (tilting) while correction and adjustments are feasible at several stages of operation. In Italy this method is widely employed in Ravenna to make copies of ancient mosaics and in Rome. In Spilimbergo, it is rarely used. When it is, tesserae are directly glued onto a temporary paper backing bearing the outlines of the design. When the facing or other sheet of paper is applied to facilitate the lifting process.
(F.M. from Fischer 1971, 146-147; Goodwin 1985, 54-56; Bull 1976, 41; Jenkins 1957, 64)

DIRECT METHOD

The direct method of laying mosaic is the traditional one, used from early times. Tesserae are embedded in a setting bed of synthetic resin binder, lime or cement mortar, which is applied in sections of suitable size for a day's work (*giornata*). It is possible to work directly *in situ* (wall or floor) or in the studio using movable supports or cement slabs broken down into sections. This method enables surface variety to be achieved by adjusting the depth of setting of tesserae (tilting), however a learned and skilful mosaicist is needed because, after the binder has set, it is no longer possible either to correct or vary the arrangement of the rows of tesserae. In Italy this method is currently used in the schools of Ravenna and

Spilimbergo.

(F.M. from Fischer, 1971, 146; Haswell 1973, 145; Jenkins 1957, 36)

MOSAICIST
 MOSAIC MAKER
 STONE-SETTER
 TESSERA WORKER

Artist or craftsman who executes mosaics.
(Mosaics 1966, 56-57; Waage 1982, 464)

INDIRECT METHOD
 REVERSE -
 PAPER PROCESS
 PARCEL MOSAIC

This method was invented in the 19th century, however a number of scholars believe that it was already practised in antiquity. (1) Using a water-soluble glue, tesserae are first pasted, face downward, onto a strong paper sheet bearing the design in lateral inversion. When completely covered, the sheet of paper can be lifted, turned over and pressed into a prepared setting bed. Time is allowed for setting and then the paper is thoroughly dampened and peeled off. This method produces a plane and smooth surface (particularly useful for floors) but offers several advantages: work in studio is easy and quick, errors can be justified at any time, mosaics are produced at a low cost. In Italy it is widely employed in commercial mosaics and at the school of Spilimbergo.
(F.M. from Haswell 1973, 145; Fischer 1971, 146; Goodwin 1985, 46; Jenkins 1957, 37)

With the term "indirect method" some scholars (Neal, Johnson) mean the system of application known as "double reverse method".
(F.M. from Neal 1976, 244; 1981, 20; Johnson 1987, 7)