AMIANTHUS, or MOUNTAIN FLAX, in *Mineralogy*, Αμιανθος, Gr. *Amianthus. Byſſus montanus. Linum montan. Lana montan. Linum incombuſtibile. Lapis Cyprinus*, Lat. *Amianth. Bergflachs. Federweiſs*, Germ. *Berglin*, Swed. *Bierghor*, Dan. *Amianth Kölen*, Hung. *Amianth*, Ruſſ. *Lin foſſile. Amianth.* Fr. *Amianto. Fior di pietra*, Ital. *Talcum aſbeſtus amianthus*, Werner.

The colour of amianthus is generally greeniſh or ſilvery white, approaching to mountain green, more rarely yellowiſh white, olive, or leek green, ochre yellow, or pale fleſh red.

It occurs uſually amorphous, but ſometimes in ſmall ſeparate bundles. Its luſtre varies from glimmering to ſlightly ſhining, and is either weak-pearly or ſilken.

Its fracture is fine, and for the moſt part alſo ſtraight, and even fibrous, rarely curved. It flies, when broken, into long ſplintery fragments.

It is found uſually ſlightly tranſparent, but often opaque. Is ſoft enough to be ſcratched by the nail, and is conſiderably elaſtic. It has a ſoft, ſomewhat greaſy feel.

The ſpecific gravity of amianthus, according to Muſchenbroeck, is 2.444. According to Briſſon, before it has abſorbed water, it varies from 0.9088 to 2.3134; after abſorption, it is from 1.5662 to 2.3803.

This mineral is principally met with in pot-ſtone or ſerpentine rocks, either diſperſed through them as a conſtituent part, or accumulated in their clefts and crevices unmixed with any other ſubſtance. The Tarentaiſe, in Savoy, furniſhes the pureſt and moſt beautiful. It is alſo met with in Corſica, the Iſle of Elba, and Crete; near Zoblitz in Saxony, Salberg, and Swartwick in Sweden; in Cornwall and the iſle of Angleſea in England, and at Portſoy in Scotland.

A filament of the Tarentaiſe amianthus, when expoſed to the flame of the blow-pipe, melts into an opaque globule, which becomes dark-coloured by the continued action of the flame. It diſſolves quietly in borax and microcoſmic ſalt, and effervesces with carbonated ſoda. If expoſed in an earthen crucible to a high heat it melts into a denſe ſcoria, ſtrongly adherent to the bottom of the veſſel, of a yellowiſh grey colour, but almoſt white where it is in contact with the crucible, which laſt is in ſome degree penetrated and corroded. The ſurface of this ſcoria is overſpread with cryſtalline needles croſſing each other in all directions, or radiating from a common centre; ſimilar acicular cryſtals are diffuſed through the ſubſtance of the maſs. Theſe needles are a little thicker than a hair, and when viewed by a magnifier, appear perfectly tranſparent, of a quadrangular, priſmatic figure, whoſe angles and faces are remarkably brilliant and well defined; whereas the filaments of the amianthus, in its natural ſtate, are much too fine to allow of their form being determined even by a very powerful lens. This ſcoria, on expoſure to a greater heat, changes into a green glaſs, incapable of cryſtallizing, and which, in a ſhort time, paſſes through the crucible. A ſpecimen of greyiſh white amianthus afforded Mr. Kirwan, at 162°.5 Wedgewood, a greeniſh black, perfectly compact glaſs. A ſpecimen of amianthus from Greenland, according to Klaproth's experiments, being incloſed in a charcoal crucible, and expoſed to the full heat of a porcelain furnace, fuſed into a ſcoria of a dirty pearl-grey, covered externally with ſmall grains of iron; its fracture ſhewed a dull, finely porous texture, inlaid with ſeparate, gloſſy particles.

The action of the mineral acids on amianthus is very feeble; the nitric and ſulphuric take up no more than three or four per cent.; the nitro-muriatic, in the proportion of ten parts to one of the foſſil, diſſolves about 12 per cent. conſiſting of lime, magneſia, and a little barytes.

Carbonated potaſh, even aſſiſted by ignition, is equally inefficacious with the acids in decompoſing this ſubſtance. The Tarentaiſe amianthus, mixed with four parts of pure ſalt of tartar, and ignited for two hours, only afforded 12 per cent. of matter ſoluble in ſulphuric acid.

The real ſolvent of this refractory mineral is cauſtic potaſh, as appears from Bergman, who, by mixing equal parts of amianthus, carbonated potaſh, and charcoal, and igniting them for two hours, obtained a maſs perfectly ſoluble in nitromuriatic acid. This eminent chemiſt was not, indeed, aware that the addition of charcoal rendered his alkali cauſtic, the reaſon of his uſing charcoal being to decompoſe the ſulphat of barytes, to which he attributes the extraordinary refractorineſs of this ſubſtance.

The Tarentaiſe amianthus, according to Bergman, is compoſed of

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| Sulphated barytes | 6. |
| Carbonated Lime | 6.9 |
| Carbonated Magneſia | 18.6 |
| Alumine | 3.3 |
| Silex | 64. |
| Oxyd of iron | 1.2 |
| | 100.0 |

That of Swartwick contains—

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|---|---|
| Carbonated Lime | 13.9 |
| Carbonated Magneſia | 17.2 |
| Alumine | 2.7 |
| Silex | 64. |
| Oxyd of iron | 2.2 |
| | 100.0 |

That of Corias in Auſtria yields—

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|---|---|
| Carbonated Lime | 10.5 |
| Carbonated Magneſia | 12.9 |
| Alumine | 3.3 |
| Silex | 72. |
| Oxyd of iron | 1.3 |
| | 100.0 |

It is rather ſingular that ſulphated barytes ſhould have been found in the Tarentaiſe amianthus, as this earthy ſalt

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does not once occur among the analyſes of the Swediſh or Auſtrian ſpecimens, or among thoſe of aſbeſtus, ſteatite, and other minerals that have the neareſt analogy to the amianthus; it is therefore greatly to be wiſhed that ſome able chemiſt, in poſſeſſion of the modern improved means of analyſis, would undertake afreſh the examination of this mineral.

Amianthus is often confounded with the more flexible kinds of Asbestus, to which it bears a near reſemblance in external characters and chemical compoſition. Its fibres are, however, for the moſt part, more diſtinct and flexible than thoſe of aſbeſtus; it is more fuſible *per ſe*, and is conſiderably leſs acted upon by acids.

The fibrous texture of amianthus, its incombuſtibility, and the little alteration that it undergoes even in a ſtrong heat, were early noticed, eſpecially among the eaſtern nations; and methods were found out of drawing the fibres into thread, and afterwards weaving it into cloth: this, when dirtied with greaſe or other inflammable matter, was cleaned by throwing it into a bright fire; the ſtains were burnt out, and the cloth was then removed, but little altered in its properties, and of a dazzling white; hence it obtained from the Greeks the name of Αμιαντος (undefiled). In the rich and luxurious times of the Roman empire, this incombuſtible cloth was purchaſed at an enormous price, for the purpoſe of wrapping up the bodies of the dead previouſly to their being laid on the funeral pile, that the aſhes of the corpſe might not be ſcattered and mixed with thoſe of the wood. This practice was indeed probably confined to a few of the richeſt families, but of its reality there can be no doubt, eſpecially ſince a funeral urn was diſcovered in 1702 at Rome, near the Porta Nævia, in which there was a ſcull and other calcined bones, together with a quantity of aſhes incloſed in a cloth of amianthus nine Roman palms long, and about ſeven palms wide. This intereſting relic of antiquity was depoſited, by order of pope Clement XI. in the Vatican library.

The diſuſe of burning the dead occaſioned the manufacture of amianthine cloth to be neglected, and at length entirely forgotten in Europe; but though it has ceaſed to be an article of neceſſity or luxury, yet the method of its preparation has occaſionally attracted the notice of travellers, and occupied the time of the curious. Marco Polo aſſerts, that in the Eaſt the mineral is gently bruiſed in a mortar to ſeparate the fibres, and being waſhed till the water comes off clear, is dried, and then manufactured as flax or wool. Ciampini of Rome, in 1691, and then Mahudel, after many trials, publiſhed the following as the beſt way of preparing the incombuſtible cloth. Having previouſly ſteeped the amianthus in warm water, divide its fibres by gently rubbing them with the fingers, ſo as to looſen and ſeparate all the extraneous matters, then pour on repeatedly very hot water, as long as it continues to be in the leaſt diſcoloured. Nothing will now be left but the long fibres, which are to be carefully dried in the ſun. The bundles of threads are to be carded by very fine cards, and the long filaments thus obtained are to be ſteeped in oil, to render them more flexible. A ſmall quantity of cotton or wool is to be mixed, and by means of a thin ſpindle the whole is to be drawn into thread, taking care that the amianthus may in every part be the principal material. The cloth being then woven in the uſual manner, is to be placed in a clear charcoal fire to burn off the cotton and oil, when the whole remaining tiſſue will be pure white amianthus. The ſhorter fibres that are incapable of being woven have been ſometimes made into paper; the proceſs of which is the ſame as that employed for common paper, except that a greater proportion of paſte or ſize is required: after having been once made red hot, however, the paper becomes bibulous and brittle. For written documents of great importance, it might be worth while to be at extraordinary expence for incombuſtible paper and indelible ink; the former of theſe may be prepared from the longer fibres of amianthus, ſo as to be much leſs brittle than when the ſhorter ones are alone made uſe of; and for the ink the following receipt will be perfectly efficacious. Take one part of ſulphat of iron (green vitriol) and two parts of alum, diſſolve them together in warm water, and then add pearl-aſh as long as any precipitate takes place; boil the mixture, and throw it on a filter, allow the precipitate to drain after being waſhed with warm water, and, while yet ſoft, diſſolve it in diſtilled vinegar; uſe this moderately concentrated for ink, and the characters, after combuſtion, will be of a yelloviſh brown colour, and ſufficiently legible.

Amianthus threads are alſo ſometimes uſed as perpetual wicks for lamps; they, however, occaſionally require cleaning from the ſoot that collects about them; and in the hotteſt part of the flame the fibres are apt to run together, in a ſtate of ſemifuſion, ſo as to prevent the due ſupply of oil. Weidenmann, Handbuch der Mineral. p. 465. Lenz. Verſuch, &c. vol. i. p. 371. Ciampini, de Incombuſtibili Lino, Romæ, 1691. Mahudel de Lino Incombuſt. Mem. de l'Acad. des Inſcriptions, vol. vi. Bruckmann. Hiſt. Nat. curioſa Lapidis τῦ ασβεςυ, Brunſvigæ, 1727. Kirwan's Mineralogy, vol. i. Klaproth's Analytical Eſſays. Bergman, on Aſbeſtine Earth, Eſſ. vol. iii. p. 181. Sauſſure, Voyages dans les Alpes, § 113. and following, § 1914. Bomare, Dict. d'Hiſt. Nat. article Amiante.