crystallised from absolute alcohol, it forms slender needles, which retain a molecule of water of crystallisation and melt at 250°.

Analysis gave the following results: $C = 56\cdot04$; $H = 9\cdot00$; $H_2O = 6\cdot59$; $C_{13}H_{23}O_4N,H_2O$ requiring $C = 56\cdot67$; $H = 9\cdot16$; $H_2O = 6\cdot55$ per cent.

Acetyl Derivative of the Acid.

The amino-acid hydrochloride is soluble in a mixture of glacial acetic acid and acetic anhydride, and on heating the solution to a temperature near its boiling point for about five hours acetylation takes place and hydrogen chloride is expelled.

The acetyl compound is deposited on evaporating the solution, and it may be recrystallised from a mixture of glacial acetic acid and ethyl acetate in microscopic, rhombic plates which melt at 223°.

It was found to contain $N = 5\cdot34$, whilst $C_{13}H_{21}O_5N$ requires $N = 5\cdot18$ per cent.

This amino-acid and its hydrochloride appear to interact with benzaldehyde and with glycocine when heated with those substances. The products will be examined when more material has been prepared.

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CLVII.—*The Description and Spectrographic Analysis of a Meteoric Stone.*

By Walter Noel Hartley, D.Sc., F.R.S.

The following are particulars concerning a stony meteorite from Northern Punjaub, India. It was sent from the Chemical Laboratory of the Medical College, Lahore, by Lt.-Colonel Donald St. John Dundas Grant, of the India Medical Service, the Chemical Examiner for the Punjaub Government.

The label attached was dated 21/7/97, and I received the parcel on September 28th, 1897, at Grantown, Morayshire. Both Col. Grant's letter which preceded the parcel containing the meteorite, and the label enclosed with the stone, described it as having been seen to fall in the Kangra Valley.

This shows it to be of uncommon interest, for of all the meteorites in the fine collection in the British Museum there are but few which have actually been seen in the course of their descent to earth.

Description.—The aërolite measures 3 in. × 2 in. × $2\frac{1}{4}$ in. (or 75 mm. × 51 × 57); its present weight is 395 grams, and not more than 2 grams, if as much, have been removed.

It was broken on one side before it reached me, and no doubt the fracture may have been caused by its fall. It is of irregular shape, all angularities being rounded by incipient fusion, and the fused surface or skin is for the greater part quite black, but it has a dark red or chocolate-coloured patch on one side. The fractured surface shows a crystalline base with a multitude of irregularly shaped small masses of metallic iron of bright silvery appearance, about 0·5 to 1 mm. in diameter, which are distributed through it. The crystalline stony matter is of a pale grey colour, and judging from the spectrographic analysis it is probably a mixture of calcium orthosilicate with magnesium orthosilicate, corresponding to the minerals enstatite and olivine. On powdering the mass, all the metallic particles were collected by a magnet. On immersion of the meteorite in water in order to take its specific gravity it was found to be porous. The absorbed water was readily removed by suitable desiccation, but the exposed metallic particles on the fractured surface thereby became rusted. Spectrographic analyses were made of the separated metallic and the siliceous portions of the mineral according to the modified method already described (Hartley and Ramage, Trans., 1901, 79, 61).

The magnetic metallic part was burnt in two portions on ashless filter papers, ten of which in the aggregate showed nothing more than the feeble sodium lines when submitted to the same treatment.

Analysis of the Siliceous Portion.—The reagents used were distilled water, sulphuric acid, ammonium fluoride, ammonium carbonate, and ammonium oxalate. The former left no residue on evaporation. The ammonium fluoride was freshly distilled in a platinum retort, and on subliming 5 grams in a platinum basin it left no trace of any residue. The ammonium carbonate was submitted to the same treatment and was found to be pure. The sulphuric acid in the same manner was also proved to be free from any impurity. The mineral, ground to an impalpable powder in an agate mortar, was decomposed by digesting it with three times its weight of ammonium fluoride mixed with seven times its weight of pure sulphuric acid at about 50° in a platinum basin. When the silicon fluoride had ceased to be evolved, the temperature was raised until all the sulphuric acid and much of the ammonium sulphate had been expelled. The residue from this treatment was boiled with water and a little nitric acid to peroxidise the iron; to this solution, reduced to a small bulk by evaporation, a slight excess of ammonia was added. The precipitate, which contained chiefly alumina and ferric oxide, was collected on an ashless filter paper, dried and ignited in a roll of the same paper in the flame of an oxyhydrogen blow-pipe fitted with platinum jets, and its spectrum was photographed. The solution containing the heavy metals and metals of the calcium group was mixed first with ammonium carbonate and filtered, then with ammonium oxalate, and again filtered. The filters were dried and burnt, the spectra being photographed as before. The filtrate from the ammonium oxalate precipitate was evaporated to a small volume, absorbed by ashless filter papers, and burnt, another photograph being taken. All these manipulations were carried on in platinum vessels.

The following are the results of the analyses:

The Metallic Portion.—Spectra 1 and 2 yielded iron, nickel, chromium, cobalt, gallium, manganese, copper, silver, lead, calcium, potassium, and sodium.

The principal constituents of the metal are iron, nickel, cobalt, and chromium, with small quantities of copper, silver, lead, and gallium. The manganese, calcium, potassium, and sodium were present in minute proportions.

The Basic Constituents of the Silicates.—Spectra 3, 4, and 5 showed the presence of iron, nickel, chromium, gallium, magnesium oxide bands, calcium oxide bands, strontium oxide, lead, silver, manganese, potassium, and sodium.

The principal constituents of the silicates are calcium oxide and magnesium oxide. The other bases are in minute proportions.

The aërolite was put aside for the purpose of making careful chemical analyses of the metal and of the non-metallic portion, but owing to various considerations, not the least important being the necessity for breaking off a larger portion of the material, it was decided not to injure it any further, but to preserve it as a museum specimen.

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CLVIII.—*Malacone, a Silicate of Zirconium, containing Argon and Helium.*

By Edward Stanhope Kitchin and William George Winterson, B.Sc. (Lond.).

The earliest published account of malacone is contained in a paper by Scherer (*Pogg. Ann.*, 1844, 62, 436), who gave a brief description of the crystallography of this mineral, which forms greyish-black crystals resembling porcelain in appearance and of the same hardness as felspar. Scherer found its specific gravity to be 3·913, whilst as a result of four observations we obtained the value 3·908. If the