

**The Bassikounou Meteorite Fall -  
Descriptive Catalog of the Recovered Masses\* Vol.1**

**\* until June 30, 2007**

**Svend Buhl and Matthias Baermann**

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# The Bassikounou Meteorite Fall – Descriptive Catalog of the Recovered Masses\*

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## **Methodical approach**

To gather information on the total recovered weight, the mass distribution and the general characteristics of the meteorites recovered from the Bassikounou event the authors approached finders, local Mauritanian citizens, mineral dealers, curators and collectors with their request for information on the masses collected. Until June 30, 2007, 88 persons submitted relevant information on the meteorites they found, possessed, or dealt with. Some masses were sent to the authors for examination and documentation but the majority was documented by their respective owners according to the author's standard briefing. This included the recording of basic data and the production of photographs from all sides as well as close ups of the surface and of special features e.g. adherent soil. By this way the authors collected more than 600 images of Bassikounou meteorites. Informants with no access to photographic equipment, particularly in the find area in Mauritania, submitted basic data as well as descriptions and/or drawings.

In the later stage of the undertaking, in June 2007, a steady average of 20 meteorites per month were reported to the authors. But of the 22 individual masses submitted in June 2007 21 had already been catalogued previously either individually or under a lot. Judged by this number of particular meteorites that were sent in redundantly either from finders, dealers or end owners it can be said that the current catalogue covers approx. 90% of the total TKW. The Mauritanian Army according to our calculations keeps an approx. 5% of the TKW while another 5% is either on transit from the find area to distributors in Morocco or being held by locals. The average time a Bassikounou meteorite travelled from the strewn field to the mineral bazaars in Erfoud, Rissani or Zagora in Morocco is 42 days, and 60 days to the US.

Although this catalog does not give the prices asked for and paid for individual meteorites the authors think that market value is another vital aspect that impacts on the distribution and recovery of the material. Therefore a brief summary of the price curve is given here: Retail prices at the beginning of the distribution in early December (when only ~2.2kg were available to collectors) were 13 - 18 USD/gm for cut slices. When a first major batch of material became available in February/March 2007 (~16kg) prices fell to 6 USD/gm for individuals and 4 USD/gm for fragments. Meanwhile some 60kg of material are circulating in a small and fast saturating market and prices dropped to 90 Cent/gm in Morocco and during the Ensisheim Meteorite Fair in France to 3 USD/gm in Germany and the US. However Bassikounou meteorites with special features such as orientation, flow lines, impact marks or distinct regmaglyption develop along a stable 5 USD/gm.

With status of mid June 2007 meteorites are still being found on the strewn field by the locals and by organized field expeditions mainly launched from Morocco. Most of the material found recently is composed of small individuals and fragments from the northern part of the distribution ellipse. The majority of these finds show moderate oxidation and bright dust staining on the surfaces.

The descriptive catalogue at present describes 108 single masses of a combined weight of 62.18 kg individually and another 382 single masses with a combined weight of 31.66kg in lots. At June 30, 2007 the Total known weight (TKW) of the Bassikounou meteorite fall is 93.851kg. The complete report on the fall, its circumstances and its recovery can be found at [www.niger-meteorite-recon.de/en/start.htm](http://www.niger-meteorite-recon.de/en/start.htm).

## Key

### Table I. Individual masses

|                                      |  |
|--------------------------------------|--|
| #                                    | consecutive number of single mass (catalog number)   |
| weight in gm                         | individual weights   |
| character                            | type of mass. Individual: more than 2/3 of the total surface formed by thermal ablation. Fragment: less than 2/3 of the surface formed by thermal ablation |
| surfaces                             | number of surfaces   |
| crust                                | type, degree and description of fusion crust   |
| finder (f) or first known seller (s) | finder if known (f) or seller (s) who first made a respective mass public, usually by offering it to potential clients                                     |
| remarks, morphology                  | additional information, individual description of morphology   |
| distribution / current owner         | institutional or collection reference (state of June 30, 2007)   |
| image                                | reference number for image appendix  |

### Table II. Lots

|                              |   |
|------------------------------|---|
| Lot                          | consecutive number of lot (catalog number)  |
| Weight in gm                 | total weight of lot (Some of the weights given for single lots include approximate figures)   |
| average weight               | Average mass weight in gm: total weight of a respective lot divided by the number of single masses within this lot  |
| individuals                  | number of individuals within a certain lot (for definition used see above)  |
| fragments                    | number of fragments within a certain lot (for definition used see above)  |
| first known seller (s)       | seller (s) who first made a respective lot public, usually by offering it to potential clients  |
| remarks                      | additional information, collective description  |
| distribution / current owner | institutional or collection reference (state of June 30, 2007). Note that only a few end owners are known for individual masses of a certain lot. This is particularly true for those lots offered at the Ensisheim Meteorite Fair in France in June 2006 |
| image                        | reference number for image appendix   |

## I. Individual masses

Listed in the order of their find dates /appearance on the market

| # | weight<br>in gm | character  | Sur-<br>faces | crust   | finder (f) or first<br>known seller (s) | remarks, morphology  | distribution<br>/ current<br>owner   | image |
|---|-----------------|------------|---------------|---|---|--|--|-------|
| 1 | 3165.00         | individual | 8             | 6 surfaces covered with primary fusion crust, 2 fragmented surfaces                 | A. S. El Moichine (f)                   | The first mass that came to attention of the public. The meteorite is largely covered by black fusion crust. The interior is light gray. On the surface of the fusion crust there is some adherent soil material, some of which is bright red. Crust shows indications of flow lines. Shortly after recovery, the stone was cut into two pieces of 1200g (# 001a) and 1950g (# 001b). These were repeatedly cut and distributed throughout the market. | 115 g at NMBE, largest mass after cutting with T. Boudreaux, Illinois, USA | # 001 |
| 2 | 6120.00         | individual | 7             | completely covered with primary fusion crust, deep contraction cracks on some parts | Mohamed Zeroual (s)                     | Main mass. Cuboid with a pyramidal apex, distinct large regmaglypts up to 30mm diameter on three surfaces. Adherent grey colored soil on 4 surfaces. Red soil adherent, prominently on the top of the pyramidal apex.  | A. Habibi, Morocco   | # 002 |
| 3 | 434.00          | fragment   | many          | thick smooth primary crust on one surface, thin secondary crust on patches          | Mohamed Zeroual (f)                     | Specimen shows indication of later stage fragmentation.  | A. Habibi, Morocco   |       |
| 4 | 1084.00         | individual | 6             | primary crust   | Mohamed Zeroual (f)                     | Pyramidal fragment showing signs of orientation. Top corner broken off, apparently on impact. Crust shows "washed" appearance.   | A. Habibi, Morocco   | # 004 |
| 5 | 3624.00         | individual | many          | primary and secondary crust, distinct contraction cracks                            | Mohamed Zeroual (f)                     | Slightly bulb shaped. Single regmaglypts, One 2 x 2 cm chip broken off. (Thick) red soil adherent on bottom of the bulb and one more surface. One distinct curvilinear rim. (Thick) red soil adherent on bottom of the bulb and one more surface.  | A. Habibi, Morocco   | # 005 |
| 6 | 997.00          | individual | 5             | primary and secondary crust   | Mohamed Zeroual (f)                     | Bump shaped, two small chips broken off.   | A. Habibi, Morocco   | # 006 |
| 7 | 1852.00         | individual | 7             | primary crust, flow lines   | Mohamed Zeroual (f)                     | Elongated rhomboid, single bright ash grey colored patches intervowen with fusion crust, distinct flowlines. 1 corner and 4 chips broken off.  | A. Habibi, Morocco   | # 007 |
| 8 | 1800.00         | individual | 6             | primary crust   | Mohamed Zeroual (f)                     | Irregular shape with quadrangular base. Many and deep regmaglypts on most surfaces, some signs of orientation. Single bright ash grey colored patches interwoven with fusion crust. Red soil adherent on three surfaces. Melt rims.  | A. Habibi, Morocco   | # 008 |
| 9 | 1765.00         | individual | >6            | primary and extremely thin secondary crust on one surface                           | Mohamed Zeroual (f)                     | Sculpted half moon shaped individual indicating later stage fragmentation. Many regmaglypts on 3 surfaces. One white spot on fusion crust measuring ~1cm in diameter.  | A. Habibi, Morocco   | # 009 |

| #  | weight<br>in gm | character  | Sur-<br>faces | crust   | finder (f) or first<br>known seller (s) | remarks, morphology  | distribution<br>/ current<br>owner       | image |
|----|-----------------|------------|---------------|---|---|--|--|-------|
| 10 | 2205.00         | fragment   | 5             | primary crust with contraction cracks and 1 fragmented surface with signs of heating                    | Mohamed Zeroual (f)                     | Pyramidal shape with elongated rectangular base. The base shows no fusion crust but some traces of heating indication a fragmentation in the latest stage of the hot flight. Red soil adherent. Few small patches of crust chipped off. This specimen shows a remarkable black line in the somewhat grey fusion crust indicating a large altered fracture or shock vein cutting through the meteorite coplanar with the largest surface. |  |       |
| 11 | 1304.00         | individual | 6             | primary crust   | Mohamed Zeroual (f)                     | Elegantly twisted elongated cuboid. Single regmaglypts. Grey patches in fusion crust. Many regmaglypts centred on one surface. Red soil adherent.  | Dr. S. Buhl, Germany                     | # 011 |
| 12 | 874.00          | individual | >8            | primary crust with contraction cracks. Thin secondary crust on one surface with patches devoid of crust | Mohamed Zeroual (f)                     | Irregular and angular rhomboid. Single regmaglypts. One surface shows only minor signs of heating indicating latest stage fragmentation. Small patch of broken off from one of the crusted surfaces. Red soil adherent.  | offered by A. Habibi, Morocco, in 04.07. | # 012 |
| 13 | 860.00          | individual | 3             | smooth primary crust on breastside, primary crust on trailing edge                                      | Mohamed Zeroual (s)                     | Mollusc shaped disc, highly oriented. Shallow regmaglypts on trailing edge. Smooth surface on breast side with a partly corona of melt rims and few flow lines. Two small chips near edge broken off.  | Dr. S. Buhl, Germany                     | # 13  |
| 14 | 515.00          | fragment   | 6             | thick primary crust and 1 surface devoid of crust   | Mohamed Zeroual (f)                     | Flat regular cuboid fragment showing only minor signs of heating on fragmented surface.  | A. Habibi, Morocco                       | # 014 |
| 15 | 557.00          | fragment   | 7             | thick primary crust and >3 surfaces devoid of crust   | Mohamed Zeroual (f)                     | Cuboid fragment. Fragmented surfaces show various degrees of heating with patches free of any alteration indicating latest stage fragmentation. Red soil adherent.   | A. Habibi, Morocco                       | # 015 |
| 16 | 86.00           | fragment   | 4             | thick primary crust on one surface, otherwise only patches of thin secondary crust                      | Mohamed Zeroual (f)                     | Pyramidal fragment with triangular base. Various degrees of heating indicating latest stage fragmentation.   | A. Habibi, Morocco                       |       |
| 17 | 140.00          | fragment   | 5             | thick primary crust on 3 surfaces, otherwise only secondary crust                                       | Mohamed Zeroual (f)                     | Triangular fragment. Melt rims, Various degrees of heating indicating latest stage fragmentation.  |  | # 017 |
| 18 | 500.00          | individual | 6             | thick primary crust   | Mohamed Zeroual (f)                     | Incisor shaped individual. Flow lines, single regmaglypts, red soil adherent on largest surface.   |  | # 018 |
| 19 | 1084.00         | individual | many          | all over granular primary fusion crust with partial oxidation   |   | Angular mass resembling a boomerang with distinct edges and ridges, few but distinct regmaglypts, signs of orientation.  | M. Van den Dries, Belgium                | # 019 |
| 20 | 3300.00         | fragment   | 6             | oxidized primary crust all over except one large broken surface   | A. Alhyane (s)                          | Conical massive individual with large, heavily regmaglypted cavity. One large broken and oxidized surface showing two round inclusions and one long (ca. 6 cm) curvilinear shock vein  |  | # 020 |

| #  | weight<br>in gm | character  | Sur-<br>faces | crust   | finder (f) or first<br>known seller (s) | remarks, morphology   | distribution<br>/ current<br>owner | image |
|----|-----------------|------------|---------------|---|---|---|------------------------------------|-------|
| 21 | 1500.00         |            |               |   | M. Van den Dries (s)                    |   | Luc Hennion,<br>Belgium            |       |
| 22 | 1180.00         | individual | 7             | all over primary fusion<br>crust  | A. Alhyane (s)                          | Distinctly oriented mass with base of a regular pentagram. Large gently undulated top- and bottom-surfaces, resembling "stealth"-geometry. Flow lines radiating from one (minimally broken) corner. Symmetrically swung edges, few but distinct regmaglypts.  |                                    | # 022 |
| 23 | 768.00          | individual | 5             | all over primary fusion<br>crust  | A. Habibi (s)                           | Axe shaped individual with a few regmaglypts on 3 surfaces, traces of adherent brown-reddish soil on one surface.   |                                    |       |
| 24 | 499.00          | individual | 6             | one surface with primary<br>crust, other surfaces<br>show a rich dull black<br>secondary fusion crust | Mohamed Zeroual<br>(f)<br>S. Buhl (s)   | Roughly drop shaped individual but not oriented. Specimen shows a large metal concretion protruding through the surface that displays flow lines and no signs of oxidation. Secondary crust points to a later stage fragmentation.  | F. Cressy,<br>USA                  | # 024 |
| 25 | 496.00          | individual | 5             | thick & smooth primary<br>crust   | Mohamed Zeroual<br>(f)                  | Asymmetrically roof shaped individual with elongated triangular base. One corner broken off, two patches with loss of crust showing light gray interior.  |                                    |       |
| 26 | 495.00          | fragment   | 7             | primary crust and one<br>fragmented surface<br>showing only minor signs<br>of heating                 | Mohamed Zeroual<br>(f)<br>S. Buhl (s)   | Rhomboid shape with silhouette resembling a pot whale. One fragmented surface showing signs of minimal heating indicating latest stage fragmentation. Regmaglypts and distinct rollover rim on former trailing edge. One side shows adherent ochre soil, yellow streaks apparently from impact and crop fibre embedded in the adherent soil.  | M. Berecic,<br>Slovenia            | # 026 |
| 27 | 470.00          | individual | >5            | all over fresh granular<br>primary fusion crust of a<br>deep anthracite                               | Mohamed Zeroual<br>(s)                  | Rhomboid mass resembling an armadillo. Bent from front-nose to tail the stone appears slightly oriented. Two crossing, zigzagging ridges. Rough textured base surface with regmaglypts and patches of partial heating. Several small NiFe concretions and two iron veins (max. 3 cm) penetrating the crust; the metal in un-oxidized condition. Some minimal traces of ochre soil adherent. One 2mm chip broke off. | M.<br>Baermann,<br>Germany         | # 027 |
| 28 | 354.00          | individual | 4             | mainly covered with<br>secondary fusion crust,<br>two surfaces with<br>primary crust                  | M. Van den Dries (s)                    | Four iron-veins visible through crust. Two surfaces oriented along two different planes, flowlines spreading from a point on the edge separating these two surfaces.  | V. Jacques,<br>Belgium             |       |
| 29 | 353.00          | individual | 7             | five primary and two<br>secondary crusted<br>surfaces, crust is smooth<br>ly textured                 | Mohamed Zeroual<br>(s)                  | Anvil-formed individual with prismatic plane surfaces. The minimal thickness of the secondary crusted areas suggest a late stage fragmentation. Adherent traces of red soil.  |                                    | # 029 |
| 30 | 305.00          | individual | 3             | all over primary fusion<br>crust of granular texture  | Abdel Alhyane (s)                       | flat individual resembling a flounder; swinging smoothened edges, signs of oxidation  |                                    | # 030 |

| #  | weight<br>in gm | character  | Sur-<br>faces | crust  | finder (f) or first<br>known seller (s) | remarks, morphology   | distribution<br>/ current<br>owner | image |
|----|-----------------|------------|---------------|--|---|---|------------------------------------|-------|
| 31 | 251.50          | individual | 5             | completely covered with<br>primary fusion crust  | M. Van den Dries (s)                    | Smoothly sculpted, bulb shaped individual with alternating<br>convex and concave surfaces.  | R. Warin,<br>Belgium               | # 031 |
| 32 | 208.00          | individual | 6             | thick black primary crust<br>on five surfaces, one<br>surface with thin crust                      | Mohamed Lahcen (f)                      | Conical stone with signs of orientation. Roll over lipping<br>along the edges. Approx. 3 cm oblong channel with iron-flakes<br>embedded in crust  | P. Marmet,<br>Switzerland          |       |
| 33 | 197.70          | individual |               | all over primary fusion<br>crust   | M. Van den Dries (s)                    | Flat mass, triangular base.   | V. Jacques,<br>Belgium             |       |
| 34 | 183.00          | fragment   |               | large parts with primary<br>fusion crust, some areas<br>with patches of<br>secondary crust         | M. Van den Dries (s)                    | Fragmented surface with traces of minor heating indicating a<br>latest phase fragmentation; light matrix revealing one big and<br>dark inclusion.   | V. Jacques,<br>Belgium             |       |
| 35 | 160.00          | individual | 5             | primary fusion crust, one<br>surface partially with<br>secondary crust                             | Mohamed Zeroual<br>(s)                  | Shaped like a saucer, one large flat and rounded base with a<br>small apex. One distinct regmaglypt; one surface broken with<br>one patch of secondary crust, indicating latest phase<br>fragmentation. | M.<br>Baermann,<br>Germany         | # 035 |
| 36 | 89.00           | individual | 5             | thick primary fusion crust<br>of partly ash grey partly<br>dull black color                        | M. Van den Dries (s)                    | Pyramidal shaped individual with some regmaglypts, one corner<br>broke off. Color of crust partially iridescent, partially dark<br>anthracite. Signs of orientation, frothing on trailing edge.         | V. Jacques,<br>Belgium             | # 036 |
| 37 | 86.00           | fragment   | 5             | thick primary crust on<br>one surface, otherwise<br>only patches of thin<br>secondary crust        | Mohamed Zeroual<br>(s)                  | Asymmetric pyramidal fragment with triangular base. Various<br>degrees of heating indicating latest stage fragmentation   | A. Habibi,<br>Morocco              |       |
| 38 | 81.00           | individual | 5             | all over primary fusion<br>crust   | M. Van den Dries (s)                    | Triangular shaped, flat, with a spot of brownish-red Mauritanian<br>desert soil adherent  | E. Lefebvre                        |       |
| 39 | 63.00           | individual | 4             | thick primary fusion crust<br>on three surfaces, one<br>fragmented surface with<br>secondary crust | M. Van den Dries (s)                    | Asymmetrically pyramidal stone, apex and a second corner broke<br>off.  | V. Jacques,<br>Belgium             | # 039 |
| 40 | 44.00           | fragment   | many          | some signs of heating  | Mohamed Zeroual<br>(s)                  | Irregular spheroid fragment.  | A. Habibi,<br>Morocco              |       |
| 41 | 32.04           | individual |               | all over primary fusion<br>crust   | M. Van den Dries (s)                    | Conical shape, some flow lines, lipping, some grey clay coating<br>on one of the surfaces.  | Z. Gabelica,<br>France             | # 041 |
| 42 | 24.00           | individual | 3             | all over primary fusion<br>crust   | Abdel Alhyane (s)                       | Oriented conical button with splash marks and flow lines, rollover<br>rim. Grey clay adherent.  | D. Heinlein,<br>Germany            | # 042 |
| 43 | 15.00           | individual | 4             | all over primary fusion<br>crust   | Abdel Alhyane (s)                       | Canine or gyroid shaped, one 1mm chip broken from crust. Many<br>shiny NiFe specks in fresh crust.  | D. Heinlein,<br>Germany            |       |
| 44 | 11.00           | individual | 3             | primary crust of partially<br>rough texture on one   | M. Van den Dries (s)                    | Aerodynamically v-shaped stone resembling a stealth jet.  | V. Jacques                         | # 044 |

| # | weight<br>in gm | character | Sur-<br>faces | crust | finder (f) or first<br>known seller (s) | remarks, morphology | distribution<br>/ current<br>owner | image |
|---|-----------------|-----------|---------------|-------|---|---------------------|------------------------------------|-------|
|---|-----------------|-----------|---------------|-------|---|---------------------|------------------------------------|-------|

|    |         |            |      |   |                      |  |                       |       |
|----|---------|------------|------|---|----------------------|--|-----------------------|-------|
|    |         |            |      | surface   |                      |  |                       |       |
| 45 | 308.00  | individual | many | all over primary fusion crust   |                      | Cubic irregular and highly organic stone with rough, rugged and folded surface, partially flow structures; few regmaglypts. Shape differs noteworthy from all other masses.  | Dr. S. Buhl, Germany  | # 045 |
| 46 | 114.00  | individual | 4    | primary fusion crust on 3, secondary crust on one surface                     |                      | Kidney shaped stone with flat base, the base covered with secondary fusion crust.  | offered to H. Strufe  | # 046 |
| 47 | 235.00  | individual | 6    | all over primary fusion crust   |                      | Elongated wedge, two small corners broken off.   | offered to H. Strufe  | # 047 |
| 48 | 91.00   | individual | 6    | all over primary fusion crust   | A. Alhyane (s)       | Irrregular compressed bulb.  | D. Edwards, USA       | # 048 |
| 49 | 354.00  | individual | 7    | all over primary fusion crust with signs of oxidation                         | M. Van den Dries (s) | Pentagram shaped flat stone with mass concentration towards one corner. Some flow structures and a longitudinal ridge at the base side exactly marking the symmetry axis suggesting partial orientation.   | A. Lucas              | # 049 |
| 50 | 1044.00 | fragment   | 6    | approx. 50% fresh black primary fusion crust of granular texture              |                      | Wedge shaped fragment, few regmaglypts, one distinct depression at the broader side. Some metal flakes protruding through the crust. One chip broken off. Red soil adherent at one corner indicating that the meteorite hit the bottom with this part. | T. Jakubowski, Poland | # 050 |
| 51 | 13.50   | individual | 5    | all over primary fusion crust with first signs of oxidation                   |                      | Shaped like an Neolithic arrow head with fusion lip along one edge.  | B. Holmes, USA        | # 051 |
| 52 | 29.90   | fragment   | 6    | approx. 50% primary fusion crust  |                      | Bulb shaped, fragmented areas showing fresh and light grey interior.   | B. Holmes, USA        | # 052 |
| 53 | 33.20   | individual | 7    | primary and secondary fusion crust  |                      | Wedge-shaped with metal flakes visible in crust.   | B. Holmes, USA        | # 053 |
| 54 | 34.90   | individual | 5    | all over primary and secondary fusion crust with signs of beginning oxidation |                      | Axe-shaped   | B. Holmes, USA        | # 054 |
| 55 | 39.10   | individual | 6    | all over primary fusion crust   |                      | Drop-shaped  | B. Holmes, USA        | # 055 |
| 56 | 50.50   | fragment   | 6    | 5 surfaces with primary fusion crust, main surface broken                     |                      | Shaped like a lobe of the lung with a few little regmaglypts.  | B. Holmes, USA        | # 056 |
| 57 | 51.40   | individual | 6    | primary and secondary crust   |                      | Fin shaped.  | B. Holmes, USA        | # 057 |
| 58 | 62.60   | fragment   | 6    | 5 surfaces with primary   |                      | Praliné-shaped, crust showing contraction cracks, one large  | B. Holmes,            | # 058 |



| #  | weight<br>in gm | character  | Sur-<br>faces | crust   | finder (f) or first<br>known seller (s) | remarks, morphology   | distribution<br>/ current<br>owner | image |
|----|-----------------|------------|---------------|---|---|---|------------------------------------|-------|
|    |                 |            |               | fusion crust  |   | surface broken.   | USA                                |       |
| 59 | 701.00          | fragment   | 5             | primary crust and fractured surfaces  | Mohamed Azrou (f)                       | Bump shaped with quadrangular base. Apparently fragments # 59, 60 and 61 fit together and resemble a ~ 2.1 kg mass that fragmented on impact.   |                                    | # 059 |
| 60 | 655.00          | fragment   | 6             | primary crust and 3 fractured surfaces  | Mohamed Azrou (f)                       | Cube shaped with octahedral base. Two large bright patches visible in grey matrix.  |                                    | # 059 |
| 61 | 719.00          | fragment   | 5             | primary crust and 2 fractured surfaces  | Mohamed Azrou (f)                       | Flat, paddy shaped, shallow regmaglypts on bottom surface. Grey clay soil adherent.   |                                    | # 059 |
| 62 | 1110.00         | individual | 7             | all over primary crust, moderate oxidation on one surface   | Mohamed Lahcen (f)                      | Brick shaped with concave quadrangular base and a pronounced bump on the top surface. Impact damage on top surface measuring 2 x 2 cm with crust missing.                                   |                                    | # 062 |
| 63 | 1136.00         | individual | 6             | all over primary fusion crust   |   | Oriented. Shaped like an arrow head with the shafting representing the trailing side. One long shock vein visible as rim in the fusion crust. Few flow lines along the edges of the blades. | T. Jakubowski, Poland              | # 063 |
| 64 | 128.00          | fragment   | 4             | Primary crust on 3 surfaces, one broken surface   | Habibi Aziz (s)                         | Specimen shows strong orientation on both sides with flow lines and spilling covering two surfaces completely. A third surface is fragmented and partly melted over.                        | Dr. S. Buhl, Germany               | # 064 |
| 65 | 243.50          | individual | 6             | all over primary fusion crust   |   | Irregular pyramidal shape. Lipping along the complete edge of the base surface, some regmaglypts on top surface.  | Prof. Z. Gabelica, France          | # 065 |
| 66 | 2209.00         | individual |               | all over primary fusion crust   |   | Small patches of crust chipped off.   | B. Reed, USA                       |       |
| 67 | 1143.00         | individual |               | all over primary fusion crust   |   |   | B. Reed, USA                       |       |
| 68 | 1015.00         | fragment   | 6             | 4 surfaces with primary crust, 2 fractured surfaces   | Mohamed Lahcen (f)                      | Rhomboid shaped with 2 fragmented surfaces, one distinct shock vein.  | T. Jakubowski, Poland              | # 068 |
| 69 | 50.00           | fragment   | 5             | primary crust and large areas of secondary fusion crust   | Mohamed Lahcen (f)                      | Almond shaped, large patches with secondary crust indicating later stage fragmentation.   | T. Jakubowski, Poland              | # 069 |
| 70 | 49.00           | fragment   | 5             | approx. one third of the surface with primary fusion crust, some traces of secondary crust on fragmented surfaces | Mohamed Lahcen (f)                      | Almond shaped, traces of minimal heating on fragmented surface indicating latest stage fragmentation. Possibly the two fragments # 69 and # 70 belong together.                             | T. Jakubowski, Poland              | # 070 |
| 71 | 44.00           | fragment   | 4             | 3 surfaces with primary fusion crust, traces of secondary crust on fragmented surface                             | Mohamed Lahcen (f)                      | Pyramidal shaped with many metal flakes in primary fusion crust, sparse secondary crust on fragmented surface, indicating fragmentation during very last phase of flight                    | T. Jakubowski, Poland              | # 071 |

| #  | weight<br>in gm | character  | Sur-<br>faces | crust   | finder (f) or first<br>known seller (s) | remarks, morphology  | distribution<br>/ current<br>owner          | image |
|----|-----------------|------------|---------------|---|---|--|---|-------|
| 72 | 36.00           | fragment   | 5             | approx. 70% primary<br>fusion crust   | Mohamed Lahcen (f)                      | Irregular pyramidal shape with fragmented base surface.  | T.<br>Jakubowski,<br>Poland                 | # 072 |
| 73 | 82.00           | individual | 7             | all over primary fusion<br>crust  |   | Flat with quadrangular base and nose on top surface marking the<br>symmetry axis, several regmaglypts, one small white crystal<br>penetrating the crust.   | R. Lenssen,<br>Netherlands                  |       |
| 74 | 1120.00         | fragment   | 6             | primary fusion crust<br>except on one broken<br>surface with only<br>minimal traces of<br>secondary crust             | Mohamed Lahcen (f)                      | Rhomboid shaped with straight edges and some oblong<br>regmaglypts. Small patches of red soil adherent.  | T.<br>Jakubowski,<br>Poland                 | #074  |
| 75 | 209.00          | individual | 6             | all over primary fusion<br>crust  | Mohamed Lahcen (f)                      | Nearly cubic with some signs of orientation, rollover lipping, a<br>few but distinct oblong regmaglypts, one of them showing only<br>partially melting at the bottom.  | T.<br>Jakubowski,<br>Poland                 |       |
| 76 | 72.00           | individual | 7             | alternating primary and<br>secondary fusion crust<br>with traces of oxidation   | Mohamed Lahcen (f)                      | Hexagonal shaped with interwoven textures of thick primary and<br>thinner secondary fusion crust.  | T.<br>Jakubowski,<br>Poland                 |       |
| 77 | 54.00           |            |               |   | Mohamed Lahcen (f)                      |  | M.<br>Kaczmarzyk,<br>Poland                 |       |
| 78 | 40.20           | individual | 5             | primary fusion crust with<br>few signs of oxidation,<br>one area fragmented<br>with some traces of<br>secondary crust |   | Pyramidal shape with triangular base, few traces of secondary<br>crust on fragmented area indicating fragmentation during very<br>last phase of hot flight.  | M. J.Wozniak<br>& J.<br>Woreczko,<br>Poland | # 078 |
| 79 | 251.00          |            |               |   |   |  | Z. Gruba,<br>Poland                         |       |
| 80 | 39.50           | individual | 5             | thick primary fusion<br>except on one broken<br>surface   |   | Angular with lipping bent over the edges onto the fragmented<br>surface. Latest stage fragmentation.   | P. Thomas,<br>France                        |       |
| 81 | 41.10           | individual | 5             | all over primary fusion<br>crust  |   | Wedge shaped with few regmaglypts, small chip broke off.   | P. Thomas,<br>France                        |       |
| 82 | 68.70           | individual | 6             | primary fusion crust<br>except on one broken<br>surface   |   | Irregular bent fin with few dents/regmaglypts. Shock veining on<br>broken surface.   | P. Thomas,<br>France                        |       |
| 83 | 90.00           | individual |               | primary fusion crust<br>except on one broken<br>surface   |   | Elongated wedge, one corner broken off. Distinct flow lines<br>radiating from a large regmaglypt on one side of the wedge. Melt<br>lipping along the edge of the fragmented surface with partial<br>melting of the latter. Latest stage fragmentation. | P. Thomas,<br>France                        |       |

| #  | weight<br>in gm | character  | Sur-<br>faces | crust  | finder (f) or first<br>known seller (s) | remarks, morphology  | distribution<br>/ current<br>owner | image |
|----|-----------------|------------|---------------|--|---|--|------------------------------------|-------|
| 84 | 104.60          | individual | many          | primary fusion crust with few blank patches  |   | Almond shaped, flow lines. One corner and few small chips broken off, one apparently on impact.  | P. Thomas, France                  |       |
| 85 | 111.80          | individual | 7             | primary and secondary fusion crust   |   | Angular, polyedral stone with flowlines and single regmaglypts. Beginning oxidation.   | P. Thomas, France                  |       |
| 86 | 175.30          | individual | 5             | all over primary fusion crust,   |   | Rhomboid with single regmaglypts. One chip broken off along shock plane.   | P. Thomas, France                  |       |
| 87 | 1019.00         | individual | 6             | 5 surfaces with primary fusion crust, partially showing contraction cracks; one surface fragmented |   | Cuboid regmaglypted mass with spattering of secondary crust on the base, indicating a late in flight fragmentation. Abundant black shock veins. Traces of red soil adherent.           | Mile High Meteorites, USA          | # 087 |
| 88 | 65.00           | fragment   | 5             | 3 surfaces with primary fusion crust, 2 fragmented surfaces  |   | Pyramidal shaped fragment with smooth surface on the oldest surface. Obviously a fragment of a much larger mass. Signs oxidation on crust. Specimen shows signs of oxidation.          | Mile High Meteorites, USA          | # 088 |
| 89 | 5030.00         | individual | 5             | 85% primary fusion crust, showing all over a delicate pattern of contraction cracks                |   | Compact regmaglypted mass with triangular base. Well defined regmaglypts; impact marks in the the shape of of streaks of adherent red soil adherent.                                   | P. Herrman, Canada                 | # 089 |
| 90 | 641.00          | individual | 5             | all over primary fusion crust  | M. Said (s)                             | Boomerang shaped; one furrow of 2cm diameter near the tip of the shorter wing.   |                                    | # 090 |
| 91 | 52.00           | individual | 4             | all over primary fusion crust  |   | Wedge shaped with frog foot shaped fin, showing several metal-flakes penetrating the crust.  |                                    |       |
| 92 | 314.00          | individual | 6             | all over primary fusion crust  | M. Said (s)                             | Rhomboid-shaped with several distinct regmaglypts, granular structured crust with some metal flakes visible. White inclusions in crust.  |                                    | # 092 |
| 93 | 165.70          | individual | 6             | almost completely covered with primary fusion crust  |   | Trapezoid shaped base with one distinct shock vein bisecting one corner. The vein penetrates the crust and is visible as a ridge.  | M. Jensen, USA                     | # 093 |
| 94 | 68.60           | individual | 5             | almost completely covered with dark primary fusion crust   |   | Mass resembling the hull of a boat. Small chip at the bow broke off.   | M. Jensen, USA                     | # 094 |
| 95 | 58.00           | individual | 6             | almost completely covered with primary and secondary fusion crust, showing some signs of oxidation |   | Cuboid shaped with a pronounced horn.  | M. Jensen, USA                     | # 095 |
| 96 | 46.20           | fragment   | 6             | 40% primary, 20%secondary, 10% tertiary crust  |   | Mass in the shape of a foot, lipping over the edge of the fragmented surface indicating latest stage fragmentation. One 3mm chondrule visible in the matrix of the fragmented surface. | M. Jensen, USA                     | # 096 |

| #   | weight<br>in gm | character  | Sur-<br>faces | crust   | finder (f) or first<br>known seller (s) | remarks, morphology   | distribution<br>/ current<br>owner | image |
|-----|-----------------|------------|---------------|---|---|---|------------------------------------|-------|
| 97  | 33.30           | fragment   | 6             | 5 surfaces with primary fusion crust, one surface fragmented with traces of secondary crust; whole surface showing signs of oxidation |   | Fragment in the shape of a tick with a depressed concave top surface. Bottom surface fragmented with minimal signs of heating.  | M. Jensen, USA                     | # 097 |
| 98  | 18.50           | fragment   | 5             | 5 surfaces with primary, 1 surface fragmented and partially with secondary fusion crust   |   | Five cornered fragmented base with fragmented surface showing thin secondary crust along the edges and devoid of crust in the centre indicating fragmentation during the latest phase of the hot flight.                                      | M. Jensen, USA                     | # 098 |
| 99  | 17.50           | fragment   | 6             | 3 surfaces with primary, 3 surfaces fragmented and partially with secondary fusion crust  |   | Trapezoid-shaped, partially with secondary crusted surfaces, indicating fragmentation during latest phase of the hot flight.  | M. Jensen, USA                     | # 099 |
| 100 | 14.50           | individual | 6             | almost completely covered with primary fusion crust, showing some signs of oxidation  |   | Shaped like a shark tooth. Slightly oxidized.   | M. Jensen, USA                     |       |
| 101 | 14.10           | individual | 6             | all over crusted with primary fusion crust, one corner broken; crust as well as fragmented area showing some signs of oxidation       |   | Shape of a drop with attached base (fragmented). Beginning oxidation.   | M. Jensen, USA                     | # 101 |
| 102 | 13.00           | individual | 7             | 5 surfaces with primary fusion crust, 2 fragmented surfaces with some traces of secondary crust                                       |   | Compact shape with apex and one side broken off. Fragmented surface shows traces of heating indicating latest stage fragmentation. Complete surface shows signs of oxidation.   | M. Jensen, USA                     |       |
| 103 | 7.70            | individual | many          | approx. 40 % covered with primary fusion crust  |   | Pyramidal fragment with red soil adherent, obviously from a much larger mass.   | M. Jensen, USA                     | # 103 |
| 104 | 2.50            | individual | many          | all over fusion crusted   |   | Signs of minor oxidation.   | M. Jensen, USA                     | # 104 |
| 105 | 2.20            | individual | many          | all over fusion crusted   |   | Elongated trapezoid.  | M. Jensen, USA                     | # 105 |
| 106 | 314.00          | individual | 2             | all over crusted with granular and thick primary crust  |   | Oriented with a pronounced symmetrical middle-axis, shaped like a blended-wing jet with rollover lip, structured by delicate radial flow lines. Breast side surface heavily thumb printed. One corner and another patch of crust chipped off. | R. Wesel, USA                      | # 106 |

| #   | weight in gm | character  | Sur-faces | crust                         | finder (f) or first known seller (s) | remarks, morphology   | distribution / current owner | image |
|-----|--------------|------------|-----------|-------------------------------|--------------------------------------|---|------------------------------|-------|
| 107 | 137          | individual | 2         | all over primary fusion crust |                                      | Oriented shield shaped mass resembling a jelly-fish. Roll over lipping.   | R. Wesel, USA                | # 107 |
| 108 | 52           | individual | 2         | all over primary fusion crust |                                      | Oblong discoid mass with few regmaglypts, distinct broad roll over lip with some contraction cracks and two little fins; small patch chipped off. | R. Wesel, USA                | # 108 |
|     |              |            |           |                               |                                      |   |                              |       |

## Individual masses Total

| #   | weight in gm | character                                   | finder (f) or first known seller (s) | distribution / current owner |
|-----|--------------|---|--------------------------------------|------------------------------|
| 108 | 62,186.84 gm | 77 individuals<br>29 fragments<br>2 unknown | 7 finders and sellers known          | 35 owners known              |

## II. Lots

| Lot | weight in gm | average weight | individuals | fragments | first known seller (s) | remarks   | distribution / current owner                       | image |
|-----|--------------|----------------|-------------|-----------|------------------------|---|--|-------|
| I   | 1360,00      | 35.80          | 32          | 6         | Abdel Alhyane (s)      | All over fresh appearance. Reportedly collected by locals in the week after the fall. Offered May 6. 2007 from Morocco.   | several  |       |
| II  | 1950,00      | 108.30         | 14          | 4         | Abdel Alhyane (s)      | All over moderately oxidized. Reportedly collected by locals in the 3 <sup>rd</sup> week after the fall. Offered May 8. 2007 from Morocco. One fragment of 495gm is catalog # 026 already listed above (considered in TKW given below).   | Dr. S. Buhl, Germany; M. Berecic, Slovenia; others | # II  |
| III | 4550,00      | 227.50         | 12          | 8         | Abdel Alhyane (s)      | The largest mass of 2.600kg shows red soil adherent to a thick black fusion crust partly covered by contraction cracks. The other masses appear to be fresh and without oxidation. This batch was reportedly collected on the day of the fall. One 320gm mass shows grey clay adherent. | many   | # III |
| IV  | 7200,00      | 71.20          | 32          | 69        | Mohamed Lahcen (s)     | The three largest masses are 2100gm, 1100gm and 560gm respectively. Meteorites appear fresh with some clay staining. Many of the smaller fragments display a coating of laterite red dust.  | T. Jakubowski, Poland; others                      | # IV  |

| Lot  | weight in gm | average weight | individuals | fragments | first known seller (s) | remarks  | distribution / current owner                         | image |
|------|--------------|----------------|-------------|-----------|------------------------|--|--|-------|
| V    | 2800.00      | 700            | 4           | 0         | Ali Hmani (s)          | Four fully crusted individuals. The largest weighing 1050gm. This lot was offered at the Ensisheim Meteorite Fair in France in June 2007.  | Ali Hmani & son                                      | # V   |
| VI   | 4800.00      | 92.3           | 22          | 30        | Mohamed Sbai           | One large individual of 2.1 kg. This lot was offered at the Ensisheim Meteorite Fair in France in June 2007.   | several  | # VI  |
| VII  | 6700.00      | 59.8           | 42          | 70        | Ismaily Sidi Mohamed   | Three masses in the 1 kg range and many small fragments. Material appeared to be very fresh with no oxidation on most of the specimens. This lot was offered at the Ensisheim Meteorite Fair in France in June 2007. | Dr. S. Buhl, Germany, Francesco Moser, Italy, others | # VII |
| VIII | 2800.00      | 77.7           | 12          | 24        | Habibi Aziz            | One large fragment of 900gm with red soil adherent, many fragments in the 100gm range showing beginning oxidation. This lot was offered at the Ensisheim Meteorite Fair in France in June 2007.                      | Marcin Cimala, Poland, others                        |       |

### Lots total

| lots | weight in gm | average weight in gm | individuals | fragments | first known seller (s) |
|------|--------------|----------------------|-------------|-----------|------------------------|
| 8    | 31,665.00    | 69.13                | 247         | 211       | 6 sellers              |

### Combined total

| TKW in gm | average weight in gm | single masses | individuals | fragments |
|-----------|----------------------|---------------|-------------|-----------|
| 93,851.84 | 191                  | 489           | 324         | 240       |

## Distribution of individual masses

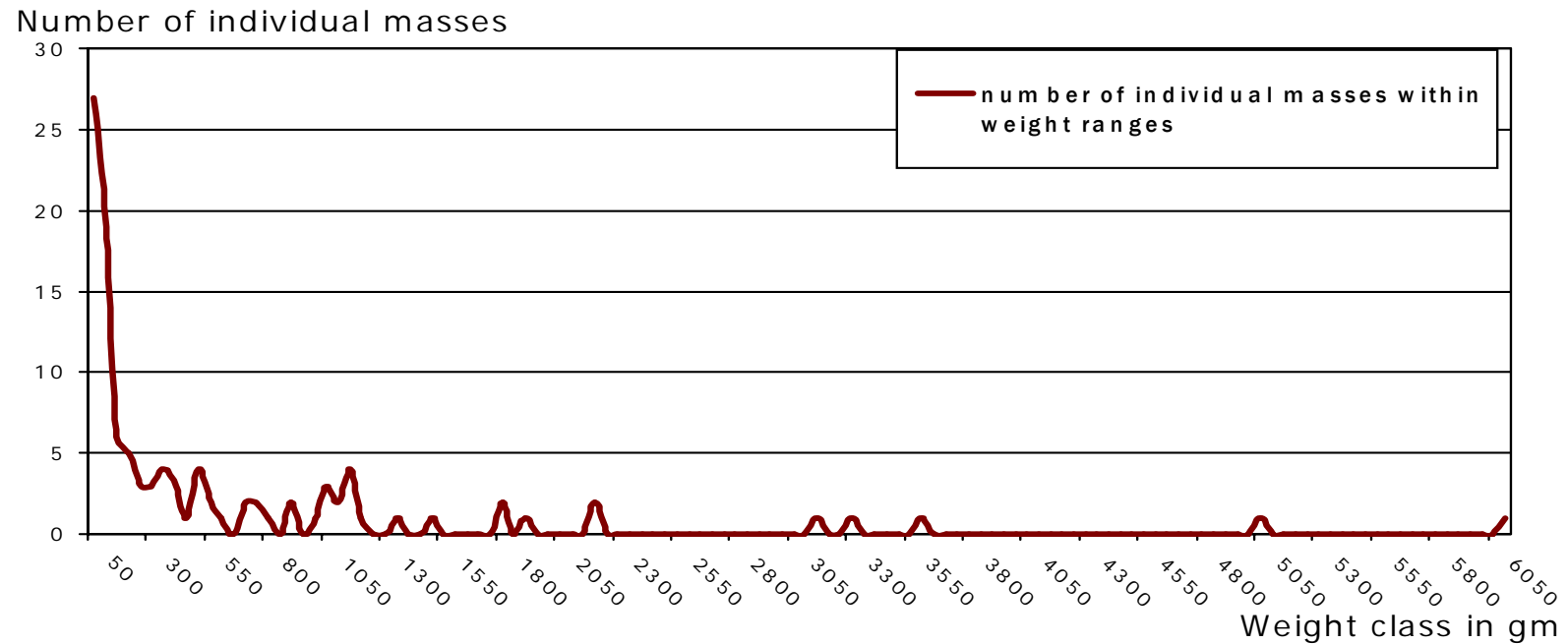


Figure shows the number of individual masses in relation to the respective weight classes. With 27 individual masses the weight class from 0-50g is best represented while above 2200g only 5 weight classes are represented by a single mass respectively. Interval is 50gm.

## Total mass distribution

weights of individual masses added in gm

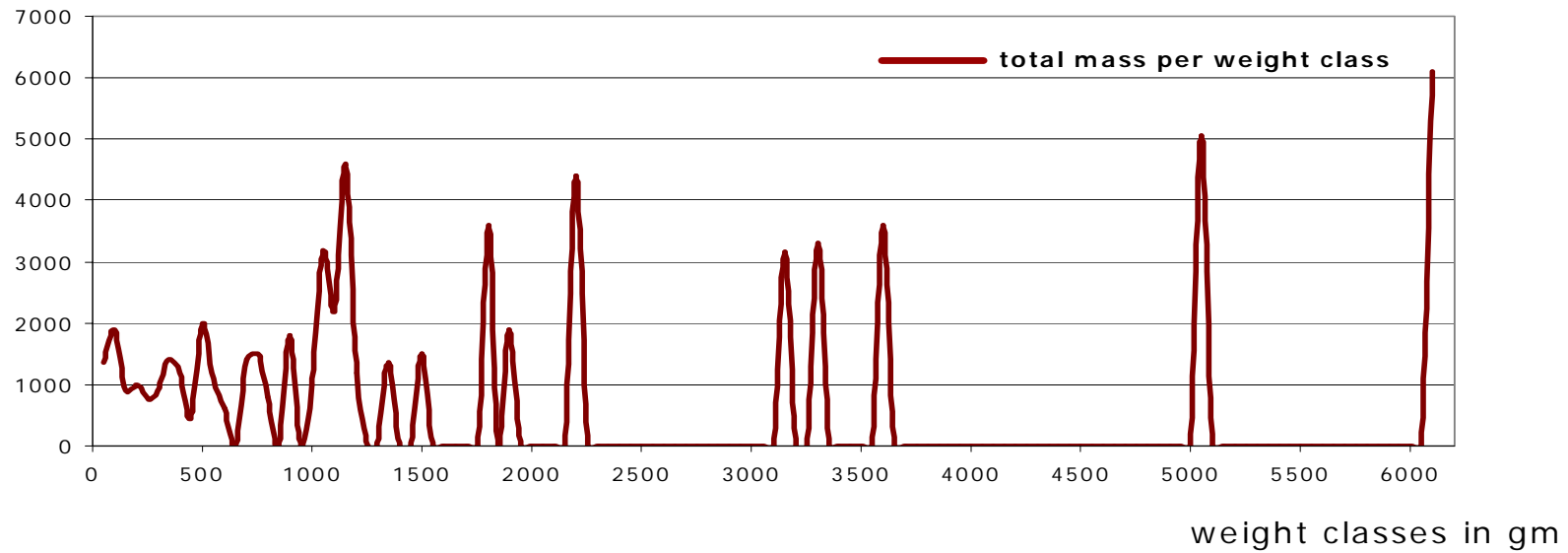


Figure shows the total mass distribution per weight class. Intervals are 500gm.



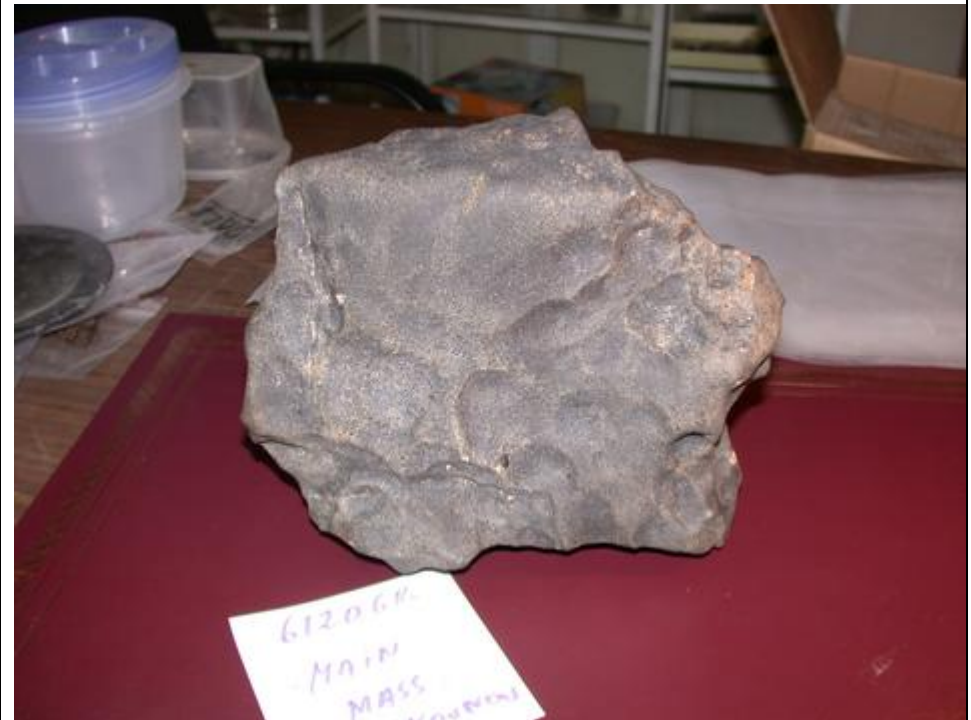
### III. Image appendix\*

\* image rights reserved. See catalog column "distribution/owner" for the owners of the image rights

# 001



# 002



# 004



# 005



# 006



# 007





# 008



# 009



# 010



# 011



# 012



# 013

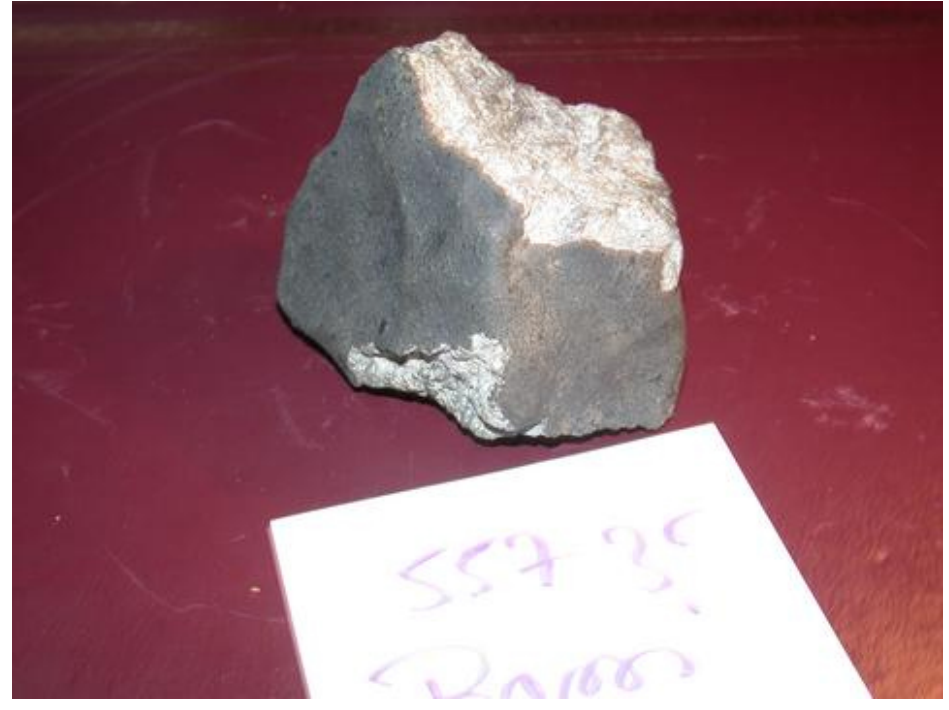




# 014



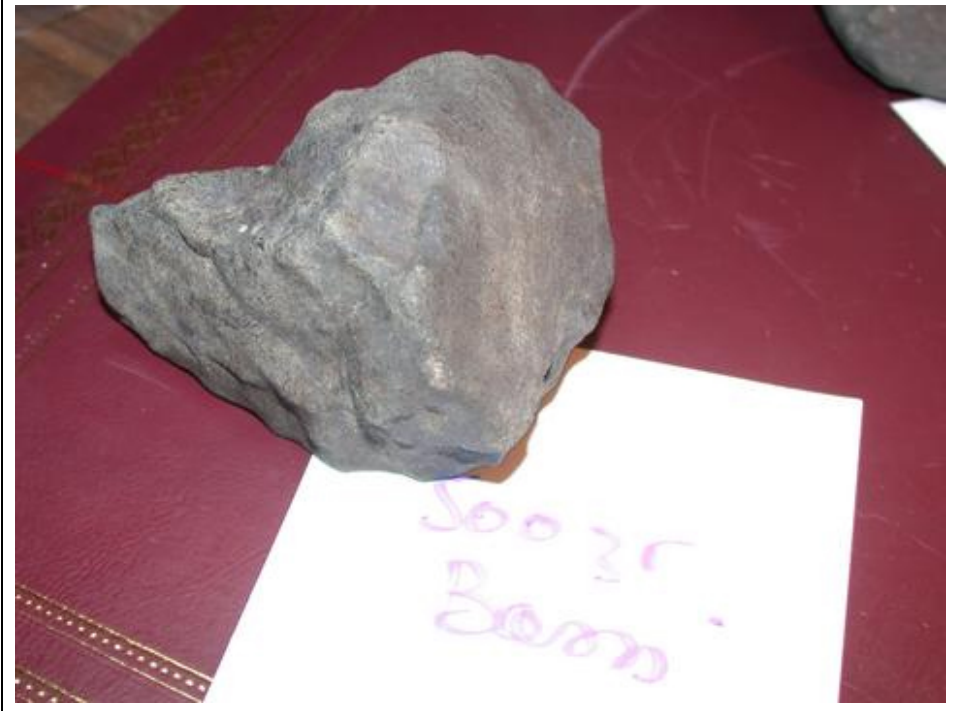
# 015



# 017



# 018





# 019



# 20



# 022



# 024





# 026



#  
027



# 029



# 030



# 031



Bassikounou H5 S2 W0 - 251.5 g  
Coll. & © 2007 R. Warin

2 cm

# 035





# 036



# 039



# 041

Bassikounou H5 - 32.04 g  
Coll. Z. Gabelica © 2007 R. Warin



# 042





# 044



# 045





# 046



# 047



# 048



# 049



# 050



# 051





# 052



# 053



# 054



# 055



# 056



# 057





# 058



# 059



# 062



# 063





# 064



# 065



# 068



# 069



# 070



# 071





# 074



# 078



# 087



# 088





# 089



# 090



# 092



# 093



# 094



# 095





# 096



# 097



# 098



# 099



# 101



# 103





# 104



# 105



# 106



# 107





# 108



Lot II



Lot III



Lot IV



Lot V





Lot VI



Lot VII



The authors are deeply obliged to all contributors of information and photographs.



## IV. Index

Masses sorted by weight

| Weight in gm | Weight class | character  | surfaces | #   |
|--------------|--------------|------------|----------|-----|
| 2.20         | 1            | individual | several  | 105 |
| 2.50         | 1            | individual | several  | 104 |
| 7.70         | 1            | individual | several  | 103 |
| 11.00        | 1            | individual | 3        | 44  |
| 13.00        | 1            | individual | 7        | 102 |
| 13.50        | 1            | individual | 5        | 51  |
| 14.10        | 1            | individual | 6        | 101 |
| 14.50        | 1            | individual | 6        | 100 |
| 15.00        | 1            | individual | 4        | 43  |
| 17.50        | 1            | fragment   | 6        | 99  |
| 18.50        | 1            | fragment   | 5        | 98  |
| 24.00        | 1            | individual | 3        | 42  |
| 29.90        | 1            | fragment   | 6        | 52  |
| 32.04        | 1            | individual |          | 41  |
| 33.20        | 1            | individual | 7        | 53  |
| 33.30        | 1            | fragment   | 6        | 97  |
| 34.90        | 1            | individual | 5        | 54  |
| 36.00        | 1            | fragment   | 5        | 72  |
| 39.10        | 1            | individual | 6        | 55  |
| 39.50        | 1            | individual | 5        | 80  |
| 40.20        | 1            | individual | 5        | 78  |
| 41.10        | 1            | individual | 5        | 81  |
| 44.00        | 1            | fragment   | several  | 40  |

| Weight in gm | Weight class | character  | surfaces | #   |
|--------------|--------------|------------|----------|-----|
| 44.00        | 1            | fragment   | 4        | 71  |
| 46.20        | 1            | fragment   | 6        | 96  |
| 49.00        | 1            | fragment   | 5        | 70  |
| 50.00        | 1            | fragment   | 5        | 69  |
| 50.50        | 2            | fragment   | 6        | 56  |
| 51.40        | 2            | individual | 6        | 57  |
| 52.00        | 2            | individual | 4        | 91  |
| 52.00        | 2            | individual | 2        | 108 |
| 54.00        | 2            |            |          | 77  |
| 58.00        | 2            | individual | 6        | 95  |
| 62.60        | 2            | fragment   | 6        | 58  |
| 63.00        | 2            | individual | 4        | 39  |
| 65.00        | 2            | fragment   | 5        | 88  |
| 68.60        | 2            | individual | 5        | 94  |
| 68.70        | 2            | individual | 6        | 82  |
| 72.00        | 2            | individual | 7        | 76  |
| 81.00        | 2            | individual | 5        | 38  |
| 82.00        | 2            | individual | 7        | 73  |
| 86.00        | 2            | fragment   | 4        | 16  |
| 86.00        | 2            | fragment   | 5        | 37  |
| 89.00        | 2            | individual | 5        | 36  |
| 90.00        | 2            | individual |          | 83  |
| 91.00        | 2            | individual | 6        | 48  |

| Weight in gm | Weight class | character  | surfaces | #   |
|--------------|--------------|------------|----------|-----|
| 104.60       | 3            | individual | several  | 84  |
| 111.80       | 3            | individual | 7        | 85  |
| 114.00       | 3            | individual | 4        | 46  |
| 128.00       | 3            | fragment   | 4        | 64  |
| 137.00       | 3            | individual | 2        | 107 |
| 140.00       | 3            | fragment   | 5        | 17  |
| 160.00       | 4            | individual | 5        | 35  |
| 165.70       | 4            | individual | 6        | 93  |
| 175.30       | 4            | individual | 5        | 86  |
| 183.00       | 4            | fragment   |          | 34  |
| 197.70       | 4            | individual |          | 33  |
| 208.00       | 5            | individual | 6        | 32  |
| 209.00       | 5            | individual | 6        | 75  |
| 235.00       | 5            | individual | 6        | 47  |
| 243.50       | 5            | individual | 6        | 65  |
| 251.00       | 6            |            |          | 79  |
| 251.50       | 6            | individual | 5        | 31  |
| 305.00       | 7            | individual | 3        | 30  |
| 308.00       | 7            | individual | many     | 45  |
| 314.00       | 7            | individual | 6        | 92  |
| 314.00       | 7            | individual | 2        | 106 |
| 353.00       | 8            | individual | 7        | 29  |
| 354.00       | 8            | individual |          | 28  |
| 354.00       | 8            | individual | 7        | 49  |
| 434.00       | 9            | fragment   | many     | 3   |

| Weight in gm | Weight class | character  | surfaces | #  |
|--------------|--------------|------------|----------|----|
| 470.00       | 10           | individual | >5       | 27 |
| 495.00       | 10           | fragment   | 7        | 26 |
| 496.00       | 10           | individual | 5        | 25 |
| 499.00       | 10           | individual | 6        | 24 |
| 500.00       | 11           | individual | 6        | 18 |
| 515.00       | 11           | fragment   | 6        | 14 |
| 557.00       | 12           | fragment   | 7        | 15 |
| 641.00       | 14           | individual | 5        | 90 |
| 655.00       | 14           | fragment   | 6        | 60 |
| 701.00       | 15           | fragment   | 5        | 59 |
| 719.00       | 15           | fragment   | 5        | 61 |
| 768.00       | 16           | individual | 5        | 23 |
| 860.00       | 18           | individual | 3        | 13 |
| 874.00       | 18           | individual | >8       | 12 |
| 997.00       | 20           | individual | 5        | 6  |
| 1015.00      | 21           | fragment   | 6        | 68 |
| 1019.00      | 21           | individual | 6        | 87 |
| 1044.00      | 21           | fragment   | 6        | 50 |
| 1084.00      | 22           | individual | 6        | 4  |
| 1084.00      | 22           | individual | many     | 19 |
| 1110.00      | 23           | individual | 7        | 62 |
| 1120.00      | 23           | fragment   | 6        | 74 |
| 1136.00      | 23           | individual | 6        | 63 |
| 1143.00      | 23           | individual |          | 67 |
| 1180.00      | 24           | individual | 7        | 22 |

| Weight in gm | Weight class | character  | surfaces | #  |
|--------------|--------------|------------|----------|----|
| 1304.00      | 27           | individual | 6        | 11 |
| 1500.00      | 30           |            |          | 21 |
| 1765.00      | 36           | individual | >6       | 9  |
| 1800.00      | 36           | individual | 6        | 8  |
| 1852.00      | 38           | individual | 7        | 7  |
| 2205.00      | 44           | fragment   | 5        | 10 |
| 2209.00      | 44           | individual |          | 66 |
| 3165.00      | 63           | individual | 8        | 1  |
| 3300.00      | 66           | fragment   | 6        | 20 |
| 3624.00      | 72           | individual | many     | 5  |
| 5030.00      | 101          | individual | 5        | 89 |
| 6120.00      | 122          | individual | 7        | 2  |
|              |              |            |          |    |