A. Wichmann, On the pseudometeorite of Igast in Livonia, in:
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Mineralogy. — "On the pseudometeoorite of Igast in Livonia'.

By Prof. Dr. A. Wichmann.

In the afternoon of the 17th of May 1855 at about 6 o'clock a lady, Miss Backmann, standing on the stairs outside a country-seat 2 miles N.E. from Walk in Livonia, suddenly saw between the lime-trees on that spot a dazzling luminiferous phenomenon, at about 6 or 9 feet above the ground, whilst she heard at the same time a tremendous clap.

At about the same time the proprietor, Mr. Fr. Schultz, found himself in a rather high field situated at a distance of 1 verst (1.067 km.) from the country-seat. He, likewise, heard in an entirely cloudless sky a violent detonation, so strong that his saddle-horse and another horse, drawing a barrow, were frightened and threatened to bolt.

Assuming, on correct grounds, that a falling meteorite had exploded, the chemist L. Bornwasser immediately made an investigation on the ground in the neighbourhood of the above-mentioned lime-trees, and collected two handfuls of peculiar mineral fragments which he supposed to proceed from that meteorite.

C. Grewingk, to whom we are indebted for the report concerning this event, described those pieces as cellular melted masses of a slaggy nature, looking much like pumiceous lava. On some fragments he found moreover numerous particles of quartz and feldspar as it were fused together with them. From the analysis made by C. Schmidt appeared the enormously high percentage of 80.87% SiO₂ of that so-called meteorite ¹). He could not identify the mass with any other earthly rock, and — on good grounds — rejects the possibility of a formation by lightning (fulgurites).

In 1881 F. J. Wink made a microscopic examination of the "meteorite" of Igast. He found larger individuals of quartz, orthoclase ²) and plagioclase, a fine-grained groundmass, and moreover little colourless, elongated crystals with globulites which he regarded as ammonium chloride ³). At last he pointed out that, for a meteorite, the mineralogical composition was quite peculiar ⁴).

²) Read microcline.
³) Hereby were meant the plagioclase-lathes. Ammoniumchloride is not extant pt all
A short time after A. von Lasaulx published the results of his microscopic examination. Though at first sight the rock showed great similarity with a basalt rich in glass-basis in which numerous grains of quartz, microcline, and plagioclase were shut up in a groundmass, consisting of brown glass, numerous grains of magnetite, little lath-shaped crystals of plagioclase, besides yellowish green grains of augite, he regarded it as an artificial product that was accidentally found at the very place where the fire-ball had been seen. He did not exclude however the possibility that it was a melting-product brought about by a flash of lightning, but he denied the possibility that it was a meteorite. In a report about van Wink's treatise Mil Cohen likewise deemed the meteoric nature exceedingly doubtful. Afterwards he asserted even that the stone of Igast was doubtless a pseudo-meteorite.

In 1884 the rock was again described by Stanislas Meunier. He acknowledged that it was quite different from all known meteorites, and pointed out its resemblance with volcanic rocks, viz. the "ponces martisifères". Consequently the rock was classed with the "météores volcaniques" by the name of "Igastite".

H. Michel treated this subject most elaborately, he published a short time ago a description in which he entered into all details, overlooked however the microscopic investigations of all his predecessors. The optical character of all the constituents of the rock were defined more exactly, but for the rest the results of his examination agree with those of the former investigators. At last he says:

"Wenn man weiter die ganzlich unmeteorische Oberfläche des Stückes, seine schlackige Beschaffenheit, das Fehlen der für alle Meteoriten so bezeichnenden thermomorphen Erscheinungen, das Vorkommen von groben Quarzkörnernaggregate neben Bestandteilen, die sonst basischen Gesteinstypen anzugehören pflegen, in Betracht zieht, kommt man wohl zu der Überzeugung, dass es sich wahrscheinlich um eine bei irgendeinem Glashütten- oder Ziegelbrennerprozess zufällig entstandene Schlacke handelt."

After what has been said before, we may no longer doubt, that

the stone of Igast is a slag of artificial formation, and consequently the chemist Bornwasser has missed the fragments of the real meteorite. H. Michel has however not solved the problem of the origin of the slag. As far as I know, such like slags do not occur in tile-works, neither does the chemical composition agree with it. In glass-works one will likewise look in vain for similar slags, quite apart from the question, how such a by-product of industry can ever have reached the isolated country-seat of Igast. Neither does the comparison with fulgurites, made by A. Van Lasaulx, hold.

In my opinion a plausible explanation can be found if we regard the discovered fragments as proceeding from a rye-slag. C. Grewingk described the product of combustion and melting of a rye-stack as a grey partly graphitic mass, having the appearance of lava or slag of the hardness 6 1/2. 1) and A. Lagorio 2) added to this, that according to the microscopic examination augite, graphite and orthoclase were secreted, and that the appearance reminded of certain glossy modifications of volcanic rock and of melting-products obtained by F. Fouqué and A. Michel-Lévy by an artificial process. 3)

It is a striking fact, that H. Michel likewise compares the microscopic character of the stone of Igast with those products. The fact that inclusions of quartz, microcline and plagioclase that do not originally proceed from that slag, are found in the rock might be thus explained, that the slag, when still in its liquid state, has run over sand so that the grains of quartz and microcline were enclosed. I must however acknowledge, that the grammeous slags which I had an opportunity of examining, did not show any resemblance with the rock of Igast, neither did they show similarity with the slag examined by A. Lagorio. The material proceeding from burnt hay-stacks, served instead. As these stood on a clay-soil it can easily be explained that the inclosed grains of sand were but few in number, but the secreted individuals of plagioclase, augite and magnetite were neither met with. In the thin sections could be discerned a light yellowish or greenish glass, in which locally numerous microlites and sometimes tridymite-aggregates were secreted. Of a similar nature was the slag formed by the combustion of great masses of straw belonging to the straw-board-works "Union"

2) Zusammensetzung von Roggenschlacken. Ibid. p. 290.
at Oude-Pekela (prov. of Groningen) on the 30th of July last. It was like dark-green glass consolidated with white pumiceous particles. The usually rather homogenous glass contained only comparatively few colourless crystals.

All these slags correspond, with regard to their general character, with similar products described by Ch. Vélain 1)

If we may now remind that the ashes of graminae do not contain aluminium 2), then it is clear, that in their slags we should look in vain for feldspar, unless a compound of aluminium had, during the melting-process, been resorbed from the soil, and secreted at the refrigeration in the shape of feldspar.

At last in addition to the above we subjoin a description of a slag owing its existence to a similar event as the one at Igast. On the 8th of June 1898 a pupil of the gymnasium of the Hague had seen a meteorite in a glowing condition explode in a garden at Voorburg.

The fragments gathered by him, which I owed to the kindness of Prof. J. F. van Bemmelen, now at Groningen, were likewise nothing else than pieces originating from a swarthy slag.


They were however more compact than those of Tgast, and inclosed grains of sand could only be discovered at the outer side. In consequence of this fact an enormous difference presents itself between the microscopic character. As becomes immediately apparent from the figure above the slag is characterized by an excellent ophitic structure. The secreting products consist chiefly of more or less elongated phenocrysts of plagioclase varying in length between 0.05 and 0.6 mm. and in breadth between 0.01 and 0.04 mm. According to the extinction-direction this plagioclase belongs to labradorite. The intervening metastasis (in the figure black) consists of a globulitic glass, in which are found numerous magnetite crystals surrounded by a light halo. They are single octaheders of which the smaller ones are sometimes arranged in lines. Locally there are in the base still aegite individuals and very narrow plagioclase slags.

The origin of this slag could not be ascertained.

**Anatomy.** — "Conclusions upon Neurobiotaxis." (The arrangement of the motor nuclei in Myxine glutinosa in Cryptobranchus, Necturus, Rana fusca and Bufo). (From the Anatomical Institute in Berlin and the Institute for Brainresearch, Amsterdam) 1). By Dr. P. Röthig; Berlin. (Communicated by Prof. L. Bolk).

*Myxine glutinosa* 2).

It is known (Anders Retzius, Johannes Müller, Gustaf Retzius, L. Edinger et. al.) that the brain of Myxine glutinosa is very rudimentary. Some parts of it are compressed in a fronto-caudal, others in a caudo-frontal direction.

The study of complete frontal, horizontal and sagittal sections reveals — as far as the mixed and motor nerveroots are concerned — the presence of the Trigeminus, Facialis and several (occipito-) spinal nerves. On the contrary there is no Oculomotorius, no Trochlearis, no Abducens and no Glossopharyngeus. Also Gustaf Retzius 3) — in his

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1) My sojourn in the Institute for Brainresearch in Amsterdam has been facilitated by a gift from the Preussische Akademie der Wissenschaften for which I want to express my thanks.

2) The specimens of *Myxine glutinosa* used for this research have been collected in Kristineberg in Sweden. They were fixed while still living and stained after various methods, chiefly after Bielchowsky. They will also be used for a monograph which I intend to publish together with Dr. Ariëns Kappers (Amsterdam) on the central nervous system of this animal.

3) Retzius, Biologische Untersuchungen N. F. Bd. V 1898, (Das Gehirn und Auge von *Myxine*).