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WITH TEN PLATES.

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1892.

In figure 11 the filings in the regions near the poles are drawn to the poles, leaving those regions bare.

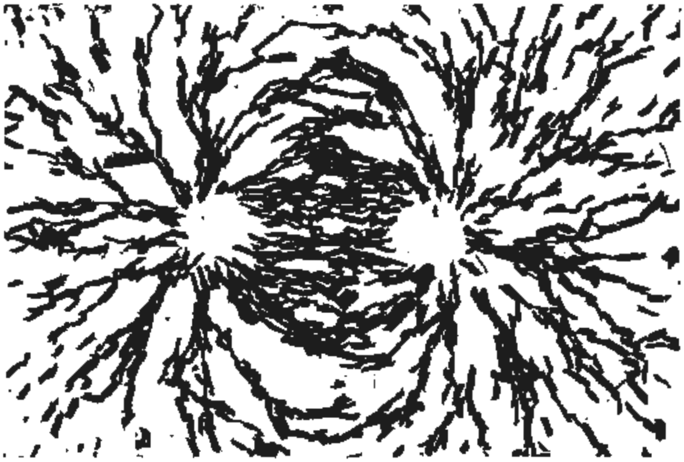

Fig. 12. Electro-Magnet—Iron Chippings.

The somewhat fantastic field shown in figure 12 was obtained from the same electro-magnet by employing coarse iron chippings, instead of the finer iron filings used in the remaining figures. The position of the bits of iron parallel to the lines of force is distinctly shown.

Note.—Since preparing the above, my attention has been called to the excellent article of Professor Houston in the Electrical Engineer for July 20th, in which a method exactly similar to the one here described was briefly outlined. This furnishes another instance of the simultaneous invention of a process by two investigators, each working wholly without knowledge of what the other is doing.

ART. XLVI.—*Contributions to Mineralogy, No. 54*; by F. A. GENTH. *With Crystallographic Notes*; by S. L. PENFIELD.

1. *Aguilarite.*

SINCE the publication of my investigations on aguilarite,* I had an opportunity to examine quite a number of specimens of this mineral. Only a *very few small fragments of pure aguilarite in skeleton dodecahedrons,* like the original, were found among them; most of them were altered, as previously

* This Journal, xli, 401.

described. There were several, however, which deserve a short notice.

a. One variety in irregular flat particles between the cleavage cracks of calcite or calcite and quartz, with a hackly fracture and iron black color had the composition of nearly pure aguilarite (*a*).

b. A second variety made up of small capillary needle- and wire-shaped individuals without any distinct planes, also minute rounded particles, all forming an irregular spongy mass of an iron gray color and metallic luster. Between this are small crystals, not over 5^{mm} in diameter, apparently hexagonal and much resembling forms of polybasite, produced by twinning. The material for the analysis (*b*) was selected with great care, but, as the results show, gave the composition of aguilarite, slightly contaminated with a sulphantimonide.

	a.	*b.*
Ag	79·41	80·27
S	5·93	6·75
Se	13·96	12·73
Cu	0·50	0·07
Fe	----	0·26
Sb	----	0·41
	99·80	100·49

c. Similar crystals, as mentioned under *b*, were found on quartz, associated with calcite, some of them were over 10^{mm} in diameter. On examination with a lens they could easily be seen to be made up of different minerals and were evidently the result of the alteration of aguilarite into stephanite, as previously described, with metallic silver, argentite, etc. The outer portion was brittle, the inner malleable—but neither could be obtained in a state of purity. They gave:

Brittle portion.				Malleable portion.			
Ag	67·58 or	Ag_2S	62·85	Ag	84·05 or	Ag	25·28
Cu	6·83	Ag_2Se	16·35	Cu	1·83	Ag_2S	55·49
Fe	0·42	CuS	9·27	Fe	----	Ag_2Se	14.28
Sb	6·83	FeS	0·56	Sb	1·24	CuS	2·75
As	----	Sb_2S_3	9·56	As	0·28	Sb_2S_3	1·74
Se	3·51	----	----	Se	3·82	As_2S_3	0·46
S	14·76	----	----	S	8·76	----	----
	99·93		98·59		99·98		100·00

These crystals had been considered to be a *new* species.

d. In the lot of aguilarite specimens was noticed a small piece of quartz and calcite with *solid* dodecahedral crystals, mostly distorted, from 1–2^{mm} in size. As there was no indication of any cavernous crystals I thought they might show a different composition.

The analysis gave:		Calculated:		
Ag	84·40	Ag	85·06	per cent.
Cu	0·49	S	11·03	"
S	11·36	Se	3·91	"
Se (by diff.)	3·75		100·00	
	100·00			

This is the composition of argentite in which $\frac{1}{8}$ of the sulphur is replaced by selenium. The composition corresponding to: $\frac{1}{8}Ag_2Se + \frac{7}{8}Ag_2S$ is given above.

c. A specimen of *acanthite* from Guanajuato, Mexico, presented to me by Messrs. Geo. L. English & Co., was analyzed for the purpose of seeing whether it contained selenium, but was found to be entirely free from it.

Elongated, wirelike distorted crystalline particles in calcite. The analysis gave a trace of quartz and calcite and—

Ag	86·79
S	13·20
	99·99

2. *Metacinnabarite.*

To Professor Gustav Guttenberg of the Central High School at Pittsburg, I am indebted for an interesting occurrence of metacinnabarite in irregular particles of from 5 to 10^{mm} in diameter, disseminated through a ferruginous, laminated barite, from San Joaquin, Orange County, California, where it had been collected by one of his pupils.

Color iron-black, but many pieces show already a partial change into ordinary cinnabarite, both by a good lens and the reddish black powder which some of the particles yield on pulverizing. Fracture conchoidal, brittle, soft. Sp. gr. 7·706. The analysis gave:

Hg	85·89
S	13·69
Cl	0·32
	99·90

It is remarkable that all the fragments which were examined showed the presence of chlorine. The 0·32 per cent of Cl which were found would indicate an admixture of 1·23 per cent of calomel.