with the exception of a measured portion at one end. The current density required to render a piece of steel passive was first determined and then the anode was placed across the poles of the electromagnet and after about five minutes was removed and the passive point again determined. The polarity of the end used was determined by means of a compass needle. The individual results varied somewhat, as was to be expected, but on the whole were remarkably uniform and always of the same character.

Table IV shows the mean results obtained.

TABLE IV.

Anode.	Electrolyte.	No. of expts.	Current for un magnetized steel per sq. cm.	No. of expts.	Curreut for N. pole.	No. of expts.	Current for S. pole.	Increase due to magnetization.	
								N.	S.
Soft steel........	5 per cent. HNO_3	7	411	4	466	3	503	55	92
Hard steel.......	5 per cent. HNO_3	12	382	6	426	6	454	44	72

Discussion.

The results presented are preliminary and are published because of the very interesting character of the phenomenon. It is our hope, by using a very much more powerful magnet and by taking pains to govern temperature and other conditions, to obtain quantitative results of greater value. In the meantime we feel that the following points are established:

1. The current density required to render nickel passive is materially increased when in the magnetic field, as was shown to be the case with iron.

2. Steel when magnetized is more difficult to render passive than is the same steel unmagnetized and soft steel is affected to a greater extent than hard steel. This accords with the observations of Andrews.[1]

3. The positive pole of the magnets is more easily rendered passive than is the negative pole.

The cause of these magnetic effects in no way appears to be indicated by the experiments and we shall have no hypothesis to offer until many more facts have been determined.

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NOTES.

Photosensitiv Antimonite Cells.—The fact that natural sulfide of antimony shows a very strong alteration of its electrical conductivity under the influence of light-radiation was discovered in 1907 by F. M. Jaeger.[2]

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[1] *Proc. Roy. Soc., London*, **49**, 489 (1893).

[2] *Proc. Royal. Acad. Sci. Amsterdam*, **9**, 808 (1907). *Z. kryst. Min.*, **44**, 45 (1908).

As the so-called "inertia" of this substance after radiation was shown to be much smaller than in the case of selenium, and as also the maximum effect was obtained in quite another part of the spectrum than with the mentioned element, I thought it would be of considerable importance to construct an antimonite-cell of high sensitiveness for practical purposes. After many attempts I was led to the following method of construction: Cleaving a crystal of natural antimonite, a lamella was obtained of about 0.3 mm. thickness. This lamella was pressed against an electrode plate of glass, covered with a large number of very fine electrodes made of gold or platinum foil of 0.001 mm. thickness. These have the shape of a grate, whose small bars are distant from each other by about 0.067 mm. The width of the grate was commonly 3 × 4 mm., thus having about 14 electrodes per sq. mm. The required pressure on the lamella is exerted by means of a small screw-press, into the frame of which insulated wires are fitted. These wires end in small elastic bars which pinch the electrode-plate and make metallic contact with the wires of the grate.

Such cells have a resistance which varies between 10^5 and 5×10^6 ohms. A very small oil-lamp placed in the immediate neighborhood of the cell decreases this resistance to 0.1 or even 0.01 of the original value. During the passage of the current the cells are extremely sensitiv to atmospheric influences. It is therefore necessary to enclose them in vaseline, as they would otherwise be spoiled in a short time, ranging from 10 seconds to 2 hours, depending upon the current density used. A potential difference of 30 volts can be used without any trouble; but one of about 150 volts after half an hour sometimes causes the resistance to increase very rapidly, until the cells get out of order. Without too high voltages, however, they seem to last indefinitly. Although there seems to be no doubt whatever about the fact that the phenomenon depends on a change in the surface-layer of the mineral, many peculiarities have been observed which are yet to be explained, such for instance as the relations between sensitiveness and thickness of the lamella or the distance of the electrodes.[1]

For the valuable assistance, which Professor F. M. Jaeger has given me during the construction of these cells, I wish to express my best thanks.

WILLIAM SEBASTIAN GRIPENBERG.

MASABY, FINLAND, September 15, 1911.

Oxidation of Arsenious and Antimonious Oxides.—In the course of some work, having for its object the preparation of certain new organic arsenic and antimony compounds, it was found that the lower oxides of these

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[1] The author is prepared to furnish cells of the kind here described. Address W. S. Gripenberg, Masaby, Finland, Europe.

two elements are converted by air into the pentoxides, much more readily than was to be expected from the statements in the literature.

The experiments were made by dissolving the organic compound in dilute alcohol, adding the arsenious or antimonious oxide and boiling the mixture for a number of hours, in a reflux apparatus. The condenser employed consisted of an ordinary quill tube, about 18 inches in length. At the completion of the experiment the liquid always possessed a distinct odor of alcohol. The oxides were employed in varying proportion and the presence of the organic compounds, other than alcohol, appeared to exert little if any effect on the results. Arsenious oxide (0.5 gram), after being boiled during 26.5 hours, with 95 per cent. alcohol (3 cc.) and water (5 cc.), was found to have been converted completely into arsenic acid. Similar results were obtained with antimonious oxide.

It is, perhaps, hardly necessary to say that the arsenious and antimonious oxides employed were free from the higher oxides. The experiments described in this note were carried out, at my suggestion, by Mr. Volney A. Ray. J. BISHOP TINGLE.

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CHAMPACA OIL.

BY BENJAMIN T. BROOKS.

Received August 12, 1911.

From time to time small samples of so-called champaca oil have reached Europe but in most cases these samples have had an uncertain origin and, moreover, European chemists have never had a sufficient quantity of the oil for thorough investigation.

True champaca oil, prepared from the flowers of *Michelia champaca* L., should not be confused with "champaca wood oil," distilled from the wood of *Bulnesia sarmienta* Lor. The sesquiterpene alcohol champacol, or guaiol, which is characteristic of the latter oil does not occur in true champaca oil.

There are at least four species of *Michelia*, which are well known in the Indo-Malay region, of which *Michelia champaca* L. is probably the best known.

Michelia champaca L. is a tree which attains a great size in certain localities. The author has seen specimens of this tree in the Royal Botanical Gardens at Peradeniya, Ceylon, which were over three feet in diameter and the curator, Mr. H. F. McMillan states that they sometimes reach even greater dimensions. With proper care the tree can be cultivated from either seed or cuttings. Marcottage is not a success with this species, though good results are thus obtained with *Michelia longifolia* L. The flowering season ordinarily lasts from the middle of June to about the middle part of October. The young trees bear flowers abundantly in