myself to the suggestion that this formation perhaps might be compared with the plexus of MEISSNER, so much finer than the plexus of AUERBACH.

Finally I may mention, that also on the walls of the blood-vessels, running along the dorsal wall of the liver, a network of very delicate nervous fibers was to be found, connected with the plexus mentioned above.

Thus it seems to me, that we have to alter the statements mentioned above, and that amphioxus possesses, in a very primitive form, a sympathetic system, which may be compared with the enteric plexus of the higher vertebrates.

Utrecht, December 1933.

EXPLANATION OF FIGURES.

Fig. 1. Microphotograph by VAN WIJHE, showing the stellate ganglioncells on the wall of the intestine, after a BIELSCHOWSKY-preparation.

Fig. 2—5. Camera lucida drawings of the elements of the nervous plexus covering the wall of the liver and of the intestine, after silver-preparations. In figg. 3 and 5 the spindle-shaped smooth muscle cells are clearly to be seen. Full-grown amphioxus lanceolatus.
BIELSCHOWSKY-method, sections treated with chloride of gold and afterwards stained weakly with haematoxylin.

Of the literature cited I will only mention the paper by VAN WIJHE, Proceedings of the meeting of the mathem.-phys. Class of the Royal Academy of Science, Amsterdam, Meeting of April 1913, BOEKE, ibidem, April 1902, FRANZ, V., Ergebnisse Anat. und Entwickel. Gesch. 27. Bd., 1927, and YOUNG, J. Z., Quarterly Journ. of Micr. Science, Vol. 75, Part IV, 1933.

Mineralogy. — *Reacting for Tungsten in Minerals.* By J. VERSLUYS and H. L. J. ZERMATTEN.

(Communicated at the meeting of October 28, 1933.)

When a mineral is identified it may be desirable to ascertain whether it contains *Ti, Mo, W* or *Nb*. The method mostly recommended for this purpose in the handbooks and described for instance in the latest editions of the works of PLATTNER [1]) and KRUG [2]), is the following.

The mineral under examination is powdered and broken down with salt of phosphorus or carbonate of soda and saltpeter, heated till all nitrates have been decomposed, after that dissolved in diluted muriatic or sulphuric

[1]) F. KOLBECK: "Plattner's Probirkunst mit dem Lötrohre". 8th ed. Leipzig, 1927.
[2]) CARL KRUG: "Lötrohrprobirkunde". 2nd ed. Berlin, 1925.

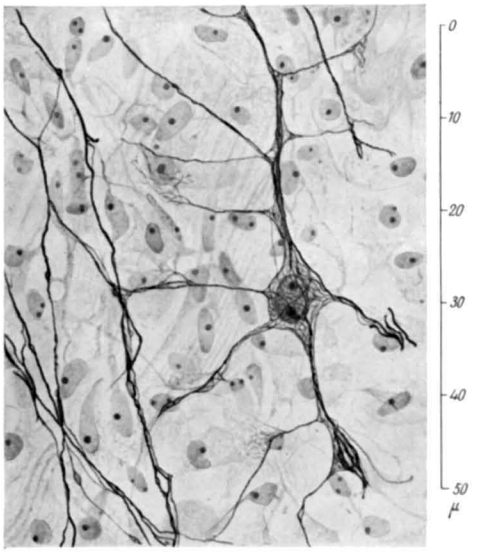

Fig. 4

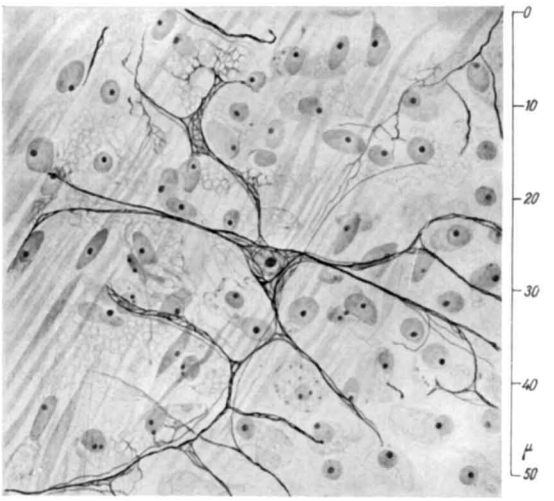

Fig. 5

acid and then heated with zinc or tin. The reactions then taking place are described as follows:

Ti: the clear liquid turns violet (p.p. 312 PLATTNER).
W: „ „ „ „ blue (p.p. 324 „),
Mo: as W, after a long reaction the liquid turns brown, finally green (p.p. 326 PLATTNER),
Nb: as *W*, but the colour disappears after dilution and does not turn brown (p.p. 314 PLATTNER).

The distinctions are not very clear, but luckily there exists another clear and simple reaction for *Ti*, viz. dissolution of the mineral after it has been broken down with carbonate of sodium in $^2/_1$ *N* sulphuric acid and addition of H_2O_2. The latter causes a yellow discoloration, if *Ti* is present. The yellow colour disappears by addition of NH_4F, in contrast with *Va*. For *W* also many reactions have been recorded in literature[1]). When the writers investigated the possibility of making a more extensive use of phosphorus salt for breaking down minerals it appeared, however, that when minerals are broken down with this salt distinctions between *Ti, Mo, W* and *Nb* at once make themselves manifest. About the reactions, then displayed by these elements, more will be communicated below. In the first place it should be observed, however, that breaking down minerals is very easily and quickly established by means of a magnesia rod[2]), especially if annealed salt of phosphorus has been provided for. One can use a hole in a white dropping-plate for the examination of the salt of phosphorus beads in which the minerals have been dissolved. Either the still liquid bead is stript off the rod on the edge of the hole or the end of the rod is broken off and put into the hole with the adhering bead. Besides the bead may be pounded with the pestle of a mortar. Then it is drenched with the liquid, in which it has to be dissolved. One can also put the liquid, in this case $^5/_1$ *N.HCl*, in the hollow first and then dip the hot bead in it. The bead can be made in a Bunsen flame and a series of beads can be made without great loss of time. Besides *Ti, Mo, W* and *Nb* there are other elements which may be detected after the mineral has been broken down with salt of phosphorus, dissolved with *HCl* and reduced with *Zn*, e.g. *Va, U* and *Cr*. These elements, however, communicate a yellow colour to the *HCl*-solution.

If the supply of air of the Bunsen flame is regulated in such a manner that it still has a slightly reductive effect, then *W* colours the bead pale green. If the bead, preferably still hot, is immersed into a few drops of $^5/_1$ *N* muriatic acid, it is coated with a violet film and the cracks in it also take this colour. With zinc powder the liquid, in which the bead is

[1]) Cf. e. g. *Enzykl. der tech. Chem.* 2e Aufl., Bd. X, p. 533, 1928 and P. DEFOCQZ: *Comptes Rendus* T. 123, 308, 1890.

[2]) The authors used the make of the STEATIT—MAGNESIA A. G., Berlin-Pankow, Florastrasse 8.

immersed, turns gradually into a beautiful violet and by this violet colour *W* distinguishes itself clearly from *Ti*, *Mo* and *Nb*. The salt of phosphorus bead of *Nb* dissolved in acid produces with *Zn* an ultramarine blue colour. The reaction for *W* can be made still more conspicuous than in the manner described above by melting the bead already with a reducing agent, such as $SnCl_2$, *Sn* or *Zn*. The bead then turns into an intense green and in $^5/_1\,N$ muriatic acid on the white dropping-plate the beautiful violet colour presents itself in this case very soon.

The method was checked with chemically pure WO_3, with the minerals Wolframite (from Cornwall, Billiton and Oruro), Hubnerite (Bolivia), Stolzite (Zinnwald) and a mixed ore from Bolivia, containing mainly Cassiterite and Wolframite. Further with a commercial product WO_3, called Tungstite.

Thus the salt of phosphorus bead may be used in order to prepare the colourless *HCl*-solution in which can be reacted *Ti*, *W*, *Mo* and *Nb*, by means of zinc. The colours, arising during the reactions, are as indicated below. Moreover under each reaction the method is given to check the result in a solution obtained after the mineral has been broken down with carbonate of sodium or of sodium and potassium.

Titanium. Colourless-pale-violet.

Check: add H_2O_2; orange yellow colour, which disappears with NH_4F.

Tungsten. Colourless-dark-violet.

Check: $HCl + Zn$, a blue discoloration.

Molybdenum. Colourless-brownish-yellow. (After being either blue or not).

Check: with potassium ferrocyanide and some solid $SnCl_2$ a reddish-brown discoloration, which becomes colourless with NH_4OH. (With *Cu* blue and with *U* yellow). If *Fe* is present a tartrate should be added.

Niobium. Colourless-grey-ultramarine blue.

Check: With *HCl* and *Zn* the same greyish-blue colour.

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June 1933.

Astronomy. — *Distribution of the nearer stars and the masses of the visual binaries.* By A. VAN MAANEN.

(Communicated at the meeting of September 30, 1933.)

A new determination [1]) has recently been made of the corrections required to bring the longer series of modern trigonometric parallaxes into

[1]) *Contributions from the Mount Wilson Observatory, Carnegie Institution of Washington*, N⁰. 474, 1933.