experiences than melancholiacs, and when treatment at home or in some other private surroundings is possible, medical men shrink from consigning their patients to such institutions; it is only when continued insomnia, wearying both to the patient and his friends, the leaning towards suicide, and refusal of food complicate the case that asylum treatment is, as a rule, advocated. Now it is just in these three conditions that opium will be found of inestimable value: it will induce sleep, create a blunting to the suicidal inclination, and diminish the mental tension, so that the patient is less disposed to oppose the administration of suitable food. 5. With Schüle and Guislain, he believes that opium can, in some cases, shorten the duration of the affection, exercising a specific influence such as is also possessed by the bromides. Its administration must, in preference, only be resorted to when the malady has lost its power, and has, as it were, expended itself; this can only be judged of by trial doses with the drug. Long-continued employment of opiates he deprecates as injurious (Ziehen, on the contrary, puts his patients for months, in some cases a whole year, under an opium course). 6. Experience teaches that opium acts better in anæmic than in hyperæmic conditions, and he agrees with Savage that it is less favourable in its action in young persons than in elderly ones and those in whom the climacteric change is exerting a morbid influence. 7. As to its influence on melancholia with stupor, authorities are not agreed. Krafft-Ebing considers it to be contra-indicated, whereas Blandford and Ziehen advocate its employment.

In conclusion, he advises that the earlier administrations should be by subcutaneous injection of morphia, commencing with small doses. Later, when given by the mouth, the dosage is to be slowly or rapidly increased, according to the effects on the patient, and it is best given twice or three times a day, the first dose early in the morning, the second and third two hours before and at bed-time. By this means the digestive functions will not be disturbed, and food may be regularly administered during the day, a matter which is, undoubtedly, of the first importance in melancholia.

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6. *Swiss Retrospect.*

Histological Technique of the Central Nervous System.

By A. Mercier, M.D., Assistant Physician to Burghölzli Asylum, Zürich.

(*Continued from p.* 481.)

Method of Staining Axis-Cylinders and Cells in a Continuous Series of Sections.

For this purpose the pieces must be imbedded in the microtome of Gudden and cut under water. This microtome has the advantages of easy manipulation and accuracy of working. The sections may be made of equal or varying

thickness, according to desire. The imbedded piece, being always covered with water, keeps well. There are two sizes of the microtome in general use—a large one by which sections of the whole brain can be cut, and a smaller one furnished with two tubes of different sizes, by which all the lesser parts of the nervous system can be cut. These microtomes have a square table standing on four iron feet. A metal basin is sunk in this table, and in the centre of this a metal tube which terminates above in a large circular plate. On this plate the knife rests. The lower end of the tube can be raised by a micrometer screw, the wheel of which records the movements in fractions of millimeters. The piece to be imbedded must first be put for a few minutes into warm water (104° F.). It must then be well dried on filter paper, and then with a small forceps placed in the tube, the bottom of which has been raised to the required degree. By experience, almost any position of the piece can be secured by propping it up, *e.g.*, on small pieces of cork. Next, the piece having been well placed in the centre of the tube, the latter is to be filled with paraffin. This requires care, lest the piece should be upset. In place of paraffin a mixture of paraffin and stearin can be used. The paraffin or the mixture must have been boiled, but at the time of pouring into the tube it must have cooled slightly, and should not make more than the characteristic "prinkling" of hot paraffin. After a minute, in order to prevent too great retraction, more paraffin should be added. In from six to twelve hours the paraffin will become hard, and the basin can now be filled with water, distilled or simply boiled and filtered. The paraffin is next to be cut away all round the piece. In twenty-four hours the cutting may be commenced. The water in the basin must be in sufficient quantity to cover the knife as it lies on the plate. In the act of cutting the knife must always rest on the plate, the thumbs being placed on the knife; the movement must be from left to right (never from right to left), and it must be performed with the thumbs, not the hands. After the first section has been cut the knife is to be put on the upper part of the ring. The section which floats on the water must be carefully removed by means of a lifter (a needle will be helpful in the removal of this section). It is then placed in distilled water, which must be in sufficient quantity to allow the section to float freely and the lifter to be removed without damage to the section. The section can remain for a longer or shorter period in the distilled water. The next section is placed in a small glass dish on the right hand of the first one; this order is maintained for the subsequent sections, and the series is numbered from left to right. It is well to label the dishes to prevent error.

When the requisite number of sections has been made it is advisable to stain only a given number each day, say from 10 to 20. The best stains where large numbers of sections are taken are those whose manipulation is the simplest. The following is the method of staining:—The dish containing the section in distilled water is quite emptied of the water, the section being carefully secured against the side by a needle. The stain is now poured on to the section so that the latter is completely covered; should it rise to the surface it must be again immersed by means of a glass rod. The time during which the sections remain in the staining fluid will depend on the nature of the section, *e.g.*, spinal cord or brain, the strength of the fluid, and the thickness of the section. Thin sections should remain in the fluid for the longer period, approximately twice as long as thick sections. The first sections of a series will need to be examined 12-18 hours after immersion, in order to determine the degree of staining. It is desirable to use weak staining solutions, since the elements of a tissue take up the colour much better if long exposed to such, than if placed for a shorter time in a stronger solution. After 18-24-48 hours, according to circumstances, the staining fluid is poured off; it may be used again if filtered. The section is drained quite dry, and then the decolorizing fluid is poured on it, and allowed to remain till no more colour is given up to the liquid. It may be necessary to change the decolorizing fluid. It is

sometimes advisable, *e.g.*, with carmine staining, to wash in distilled water before using the special decolorizing liquid. Decolorizing is generally performed with the section upon the slide. This done, one brings the slide with the section into absolute alcohol, where it should remain for 20-30 minutes or even more; it is better for the section to be too long than too short a time in the alcohol. After the alcohol bath the sections are to be immediately covered with oil of cloves or oleum origani (oil of thyme?). The sections after removal from the alcohol dry with great rapidity, hence the oil must be applied quickly and freely over the whole surface of the section—a small camel-hair brush is useful for this purpose. Should the section float on the oil it must be gently pressed under with a glass rod. The section will, in general, be sufficiently cleared after a few hours, and the oil can then be removed; in doing this it is important to secure that the section shall occupy the position which it is to maintain on the slide. The last portions of oil are best removed by filter paper. In some cases it may be found best to remove the oil by pouring on to the section a few drops of xylol, which is allowed to remain 5-10 mins. The xylol is then removed, and the section dried. The preparation is finally mounted in Canada balsam, which for smaller sections may be placed on the cover-glass, but for larger sections is best put direct upon the section. The preparation must be kept quite flat in a dry place. Moderate heat facilitates the drying of the balsam. Sunlight bleaches stained preparations; they should, therefore, be kept in closed cabinets.

1. *Ammonio-Carmine Stain.*

Gerlach's formula for this was:

1 pt. of best well-powdered carmine.
1 pt. of caustic ammonia.
50-100 pts. of water.

This solution must remain uncovered for 24 hours, to get rid of the greater part of the ammonia. Filter; cover with paper.

Friedländer speaks very well of this solution.

Stöhr recommends the following modification: 1 gramme of best carmine dissolved in 50 c.c.m. of distilled water + 5 c.c.m. of caustic ammonia. This solution is left uncovered till it no longer smells of ammonia (three days); it is then filtered and covered.

Another good formula is as follows: Rub up in a mortar 1 part of carmine, add caustic ammonia to the extent of 3-4-5 parts, rubbing constantly. Let the paste so formed dry for 24 hours, and now rub the powder with 50-100 parts of distilled water. Leave uncovered for 24 hours, and filter and then cover with paper and cork. The strengths of $\frac{1}{2}$ or 1 per cent. may be thus prepared, or by further dilution a scale of strengths may be prepared. By keeping such solutions improve; they require frequent filtering. The amount of time required for staining must be tested by using a strong and a weak solution. In general 24 hours will be required to stain this section properly. Such sections are to be then washed in distilled water for one or two hours, then in acidulated water (acid acetic., 20-30 drops; distilled water, 300 drops) for 20-30-60 mins. Then follows the alcohol bath, then the oil of cloves, then mount in Canada balsam.

2. *Nigrosin.*

Make two solutions of strength 1 per thousand and 1 per two thousand. Sections should remain in the staining fluid 12-24-48 hours, according to circumstances; in general 24 hours in the $\frac{1}{1000}$ solution will suffice.

Two methods may now be adopted—1, the section may be treated like a carmine preparation, *v.s.*, and undergo washing aq. destill. $\frac{1}{2}$-1 hour, then in aqua acidulata, etc.; or 2, the stained section may be placed for 10-15 minutes into 40% alcohol. The section rapidly gives up its colour in this. It is then washed in 96% alcohol for some minutes, then in absolute alcohol for 10 minutes, cleared in oil of cloves, and mounted in Canada balsam. The 40%

alcohol solution decolorizes much more actively, viz., in from 5-10 minutes, if a few drops of acetic acid are added to it.

3. *English Aniline Blue-Black.*

Several preparations are sold under the name of aniline blue-black; the best is the English one. This stain is very efficient and durable. The cells stain a light blue, the nucleus and nucleolus a dark blue; the cells of the cortex cerebri and cerebelli may be advantageously stained with this colour, and the cells of Purkinje in particular show up well according to Telgersma.

Pathological changes in ganglionic cells may also be well shown by aniline blue-black; the neuroglia does not stain.

Three solutions in distilled water should be prepared, of strength $\frac{1}{100}$, $\frac{1}{300}$, and $\frac{1}{1000}$. Sections should remain ½ hour in the first solution, or five hours in the second, 12 hours in the third.

Wash now in distilled water, immerse in alcohol (absolute), clear in oil of cloves, and mount in Canada balsam.

I prefer to wash in an acidulated 40% solution of alcohol instead of in distilled water, *vide supra*, and then in absolute alcohol.

Sections stained in aniline blue-black fatigue the eyes less than carmine sections.

4. *Picrocarmine.*

We follow Friedländer's directions for the preparation of this solution, viz., take of ammonio-carmine solution (carmine 1 pt., ammonia 1 pt., distilled water 50 pts., Gerlach's formula), one part, pour into it with constant stirring first a few drops, and then to the extent of 2-4 parts of a saturated solution of picric acid.

During this addition, a precipitate which forms, and at first redissolves, should finally become permanent. The larger the quantity of ammonia present the greater is the quantity of picric acid required. The liquid is now filtered, and to preserve it a few drops of phenol are added. Should the solution become turbid it will clear on the addition of a few drops of ammonia.

Stöhr's modification of this process is the following:—

℞ Distilled water, 50 c.c.m.
Caustic ammonia, 5 c.c.m.
Carmine, 1 gramme. (The quantity is not named in the paper, but see above, No. 1.)

Stir with a rod to complete the solution of the carmine.

Now add 50 c.c.m. of a saturated solution of picric acid; leave uncovered in a wide-mouthed jar for two days; filter.

This stain is in many cases excellent, giving double colouring, often within a few minutes. The nuclei are picked out deep red, the connective tissues light red, the protoplasm yellow. The differentiation, according to Friedländer, is accentuated by placing sections after staining in a watch glass containing acidulated glycerine (one part muriatic ā., 100 pts. glycerine).

The picro carmine solution stains specially well when there is present some free ammonia, but in such case the carmine tint predominates. By the treatment with acidulated glycerine the red tint is removed from the connective tissues, which may present a yellow colour, but the carmine hue persists in the nuclei. Hyaline and colloid material stains a deep yellow. The red colour of the nuclei persists, but the yellow of the picric acid is only moderately enduring. To preserve the yellow colour it is advisable to add to the water, alcohol, and glycerine used in the preparation of the section a small quantity of picric acid so as to tinge them a light yellow. Treated thus the stained sections keep their colour very well, either in glycerine or in Canada balsam.

5. *Borax-carmine.*

Mix in a porcelain dish:—Carmine, 50 c. grammes.
Borax, 2 grammes.
Distilled water, 100 grammes.

And heat to boiling with constant stirring; add, drop by drop, dilute acetic acid until the colour has changed from blue-red (at the start) to the colour of ammonia carmine; let stand 24 hours; pour off, and then filter. Add now some drops of phenol to preserve the liquid. In this solution the section acquires a deep colour after a few minutes, but the stain is diffuse. To complete the process and get differentiation the section must be placed in the following solution :—

Muriatic acid...	...	1 gramme.
Alcohol ...	...	70 ,,
Distilled water	...	30 ,,

In this solution the section gives up much of its colour. In from a few minutes up to half-an-hour it is removed, washed in distilled water or in alcohol, cleared in oil of cloves, and mounted in Canada balsam. Other authors using the same borax-carmine solution place the section in it for 5-15 minutes, wash for ½-1 minute in a solution of muriatic acid one part, alcohol 100 parts, then very thoroughly in distilled water, and then proceed with the alcohol bath, oil of cloves, and Canada balsam.

6. *Cochineal-Alum Stain.*

The method proposed and employed by Czokor gives good results. The formula is :—

1 part finest cochineal.
1 part of alum.
100 parts of distilled water.

Boil till the solution is reduced in volume by one-half; add a few drops of phenol; filter.

Sections stain in this solution in about 24 hours; they are then to be washed in distilled water and then placed in alcohol. Oil of cloves and Canada balsam complete the process.

The cells show a violet colour, the axis cylinders a more reddish tinge.

7. *Carmine-Alum.*

Take one gramme of carmine, 100 c.c.m. of a 5% solution of alum in distilled water.

Warm the mixture and boil for 20 minutes; cool; filter (Greenacher); sections stain in this solution in from 5-10-15 minutes. The subsequent treatment is as in process No. 6.

The cells are stained as in the borax-carmine process, but not so deeply; the nuclei are violet-red. The sections do not overstain, even though they be left some hours in the solution. They do not require much washing.

8. *Aniline blue.*

This substance can be employed in strong or weak solution, *e.g.*, 1 per 1,000 or 1 per 100 of distilled water. The time required for staining is 12-24 hours for the weak solution, some minutes to a few hours in the strong solution. They are to be washed in alcohol, which rapidly decolorizes them, cleared in oil of cloves, which also decolorizes them; for this reason, these stages must be rapidly gone through; then the preparation is mounted in balsam.

Cells and axis cylinders, also to a slight extent the neuroglia, are stained blue. This reagent is not to be recommended for human specimens, but the tissues of reptiles, fishes, birds, and some mammalia, *e.g.*, the calf, colour very well.

Should this process be adopted we advise that, before cutting, the piece should stand for a long time in water in order to get rid of the chrome salts.

9. *Bismark-brown.*

The solution may be either watery or alcoholic.

1. Watery. Make a saturated solution of Bismark-brown in distilled water (3 or 4%); boil; cool; filter.

2. Alcoholic. Make a concentrated solution of the stain 2-2·5% in a 40% alcoholic solution.

Let the sections stain for five minutes; wash in alcohol 96%, or in acidulated alcohol (muriatic acid 1 pt., alcohol 100 pts.); immerse in alcohol, then in oil

of cloves; mount in Canada balsam. The nuclei are stained brown; the protoplasm a light brown. The watery and the alcoholic stains colour in the same way, and the sections are not liable to over-colour themselves. Sections thus stained photograph well. The several carmine methods give better results than this reagent (V. Kahlden).

10. *Gold palladium carmine.*

Henle and Merckel have recommended this stain, which, unfortunately, has not proved successful in my hands. The section passes from water into a solution of gold palladium (1 in 500), there it remains five to ten minutes, and acquires a deep yellow colour; it is now placed in the usual ammonia-carmine solution, and in a few minutes acquires a deep red colour. Wash thoroughly in distilled water, immerse in alcohol, clear in oil of cloves, and mount in Canada balsam. The myeline fibres appear yellow, the neuroglia, cells, and axis cylinders a deep red. Ranvier adopts the plan of bringing the section after the ammonia-carmine staining into a bath of, alcohol two parts, formic acid one part. This decolorizing fluid is allowed to act for five to ten hours. The further stages are the same as just stated. The cells and axis cylinders remain red, but the neuroglia is now decolorized.

PART IV.—NOTES AND NEWS.

MEDICO-PSYCHOLOGICAL ASSOCIATION OF GREAT BRITAIN AND IRELAND.

JUBILEE YEAR.

The Fiftieth Annual Meeting of the Medico-Psychological Association of Great Britain and Ireland was held on July 23rd, at the City Asylum, Winson Green, Birmingham. At the opening of the meeting the chair was taken by Dr. Yellowlees. Among others present were Drs. H. Hayes Newington, Bonville B. Fox, Clouston, D. Nicolson, S. Rees Philipps, J. Macpherson, Oscar Woods, Conolly Norman, E. Marriott Cooke, S. H. Agar, T. Outterson Wood, E. W. White, Douglas, H. Chapman, J. Glendinning, Rutherford, Hack Tuke, W. R. Nicholson, W. S. Kay, J. G. McDowall, S. R. Macphail, R. Baker, J. Merson, A. R. Urquhart, R. Percy Smith, H. Savage, Pietersen, H. Rayner, A. C. Suffern, T. v. de Denne, Jeffries, G. H. Savage, H. T. Pringle, J. F. G. Paterson, T. H. Walmsley, N. E. Manning, Fletcher Beach (Hon. General Secretary), etc.

Apologies for absence were received from Professor Benedikt (Vienna), Professor Tamburini (Italy), Professor Krafft-Ebing (Vienna), Dr. Motet (Paris), and Dr. Morel (Ghent).

Dr. YELLOWLEES—My occupation of the chair this morning is purely formal. On taking it my first words were to thank you for the honour you did me in electing me to it. My last words in it, before I pass on the honour to my friend, Mr Whitcombe, are again very heartily to thank you. (Applause.)

Mr. WHITCOMBE then took the chair as President for the year, and said—Gentlemen, I thank you very much for the distinguished honour you have conferred upon me, feeling as I do that it is the greater because this happens to be our Jubilee meeting. We have a large amount of business to do to-day, therefore my remarks must be very brief indeed. I am glad to say that one of the first things I have to do as President is to read a telegram of congratulation from Professor Benedikt as follows: "I congratulate the Association. May it remain fresh as youth, energetic as manhood, and wise as age, and its influence alway increase for the benefit of mankind. Hail to the members! Wishes Moritz Benedikt." I propose that this telegram be placed on the minutes. (Hear, hear).

The PRESIDENT—The minutes of the last meeting were printed in the