

water containing a trace of alkali. Lithium carbonate dissolved in tap water is used by some histologists. Excess of stain may be removed by washing in $\frac{1}{2}$ per cent. acetic acid solution. Personally, I prefer the following method as much more satisfactory and expeditious: Macerate the section in the undiluted solution for five minutes in a watch-glass, gently warming over a flame. Transfer the section to a flat dish containing acidulated alcohol for a few seconds (if left too long the color is washed out), rinsing the specimen by gentle agitation with a needle. Transfer back again to tap water where it will open out at once, and by agitation the acid is got rid of. Finally, dehydrate in methylated spirit before mounting.

Acid Alcohol.—Hydrochloric acid, 1 cc.; absolute alcohol, 70 cc.; distilled water, 30 cc.

Lithium Carmine.—Carmine, 2 grms.; lithium carbonate, 1.5 gm.; distilled water 100 cc. Digest for a few days and filter. By subsequent use of acid alcohol only the nuclei are stained, and picric acid can be used as counter-stain, or in one solution as with picrocarmine.

Picrocarmine.—Carmine, 1 gm.; strong-er solution of ammonia, 3 cc.; distilled water, 5 cc.; gently warm to dissolve, and add 200 cc. of a saturated solution of picric acid; boil and filter. A drop or two placed on section itself when on the glass slip, and gently warmed, gives good results, care being taken that the section is floating in the stain. Excess is drained off and wiped away around the section, which is then mounted in Farrant's liquid. Nuclei appear bright red and tissue yellow.

Safranine.—Safranine, 0.5 gm.; rectified spirit, 20 cc.; distilled water 80 cc. Is useful for staining intra-cellular structure. It is also a specific stain for amyloid degeneration of the kidney, &c., the amyloid material reacting with an orange color, the normal tissue being pink.

Methyl Violet.—Methyl violet 0.5 gm., glacial acetic acid, 5 cc.; water to 200 cc. Allow the section to remain in this stain for some minutes, wash well with water, and mount in Farrant. Amyloid material is colored red, and the rest a bluish color.

Methylene Blue.—Methylene blue, 0.5 gm.; rectified spirit, 15 cc.; distilled water, 85 cc. Useful for staining sections of brain, spinal cord, &c. It is also largely employed as a counter-stain in the examination of bacilli, or as a direct stain of micrococci, &c.

Methyl, or Iodine Green.—Methyl green, 1 gm.; rectified spirit, 20 cc.; distilled water, 80 cc. The section is immersed for a minute in the undiluted stain, washed with water, and mounted in glycerine or balsam. Amyloid tissue is stained pink, nuclei blue, glandular structure dark green, and fibres bluish green. According to Squire the amyloid reaction is due

to the presence of methyl violet in commercial iodine green.

Eosin.—Eosin, 1 gm.; rectified spirit, 20 cc.; distilled water, 80 cc. An admirable counter-stain to haematoxylin, as it gives a red background. It requires some delicate manipulation to obtain good results.

Gentian Violet.—Gentian violet, 0.5 gm.; rectified spirit, 20 cc.; distilled water, 80 cc. Is a good nuclear stain, if the section is afterwards rinsed well in acidulated water. Also used for bacilli.

Osmic Acid.—1 per cent. solution in distilled water. It is usually recommended to be kept in the dark, as it is readily reduced; but it has been recently shown that if the distilled water is absolutely free from organic matter, light does not affect the solution. It is a specific agent for staining fat and fatty degeneration in sections, or in the lump.

Magenta.—Fuchsin, 1 gm.; rectified spirit, 15 cc.; distilled water, 85 cc. Used for detection of the comma-bacilli of Koch, &c.

Ziehl-Neelsen's Magenta.—Fuchsin, 1 gm.; rectified spirit, 15 cc.; carbolic acid, liquefied, 5 cc.; distilled water to 100 cc. An excellent stain for tubercle bacilli. Neelsen's method is to take the section from lung, immerse in weak spirit, and allow to stain in the reagent for several hours; decolorise in 2 per cent. solution of sulphuric acid in alcohol for 15 minutes, wash for the same time in water, counter-stain in methylene blue for half-a-minute, again wash in water, dehydrate in absolute alcohol, clear and mount.

Gibbes' Double Stain.—Fuchsin, 2 grms.; methylene blue, 1 gm., mix and add 3 cc. Aniline oil dissolved in 15 cc. of rectified spirit, and lastly, 15 cc. of distilled water. Is used for cover glass preparations, where pus, sputum, &c., are examined for tubercle bacilli. The stain is heated gently and the preparations immersed for five minutes, washed in methylated spirit till no more colour is removed, dry by warming, and mounted in xylol-balsam.

DEHYDRATING AND CLEARING.

Dehydration of sections which have been previously stained or removed from water is necessary before mounting in balsam. Absolute alcohol is the best agent, although methylated spirit will answer if allowed longer time. The section is transferred to the glass slip, and, if from water, allowed to drain. A few drops of absolute alcohol are dropped into the section so that it is covered and floats in the liquid, and allowed to remain for five minutes. If the section has been made in celloidin it must not remain more than two minutes in absolute alcohol or it will dissolve a portion. Clearing is usually effected by means of clove-oil or cedar-wood oil. Cedar wood oil is better than clove, as the latter removes some of the aniline colors. The alcohol is drained off from the slide and the area around the section carefully wiped. A drop or two

of oil is placed on the slip close to the edge of the section, and by inclining the slip is allowed to run under the section, which it soon saturates. It is left for a few minutes, then drained by inclining the slip on to the blotting-paper, and the area around the section again wiped clear. Excess of oil may be removed finally by gently dabbing with clean blotting-paper.

MOUNTING.

The best mounting medium is Canada balsam, which has been thinned with either xylol or benzol. A drop of xylol balsam is placed on the section, and a clean cover glass very gradually lowered over all. The proper application of cover glasses is important, or otherwise air bubbles will depreciate the value of the specimen. One edge of the cover glass should touch the slip, and a portion of it, as it is lowered, be covered with the xylol balsam. As it is gradually lowered it will drive the balsam evenly along over the section and expel all air. They should be left for a week to set.

Farrant's Medium is made, by Cole's method by dissolving 100 grms. gum acacia in 200 cc. of cold saturated solution of arsenious acid and adding 100 cc. of glycerine. Filter bright. Air bubbles may be excluded by pressing evenly and hard upon the cover glass or gently rotating it. It requires about a fortnight to set.

Glycerin Jelly is preferred for botanical sections, and the following form, published originally in the *British and Colonial Druggist*, answers well:—Gelatin, 1 oz.; water, 6 ozs.; soak two hours, and add glycerine 7 ozs. and carbolic acid 1 per cent. Warm and filter whilst hot.

The final stage of mounting is to ring the cover-glass with cement. Balsam mounts alone do not require it. White zinc cement is popular, and should be followed with a coat of asphalt varnish. If glycerine occurs in the mount, the cement should be preceded by a ring of gold size, or marine glue. It is doubtful if it is worth while for the microscopist or pharmacist to make these, but formulae for them have been published already in the *B. & C. D.—B. & C. D. Diary 1894*.

COCAINE AND BORAX IN THE PRESENCE OF GLYCERIN.—The precipitate formed by borax in an aqueous solution of cocaine hydrochlorate disappears on the addition of glycerin. This reaction presents a remarkable phenomenon, on the application of heat. The solution becomes turbid, the turbidity appearing first at the surface, and gradually extending downward, until the entire mass is affected. On cooling, the turbidity disappears completely. The author (a writer in the *Repertoire de Pharmacie*), thinks the reaction may serve for the determination of the presence of cocaine. He has thus been able to recognize one part of cocaine in 1000 parts of a solution of the same.

The magnesium light was first applied to art photography in 1864.