paraffin was raised until it was quite liquid, and then the cranium was removed and wiped clean. At the present the cranium has been exposed to such desiccation as would occur on my desk for quite some time, and there is absolutely no sign of shrinkage or alteration. This process would be applicable to the cartilaginous structure of any of the smaller elasmobranchian fishes, for there is an evident limit in the size of the cartilage to be impregnated; although the degree of infiltration necessary to preserve the cartilage would be below the standard required in microtechnical work. The cranium is in a condition for study far superior to cartilaginous material in liquid preservatives.

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PERMANENT ACETO-CARMINE PREPARATIONS

THE following method has proven useful in accurately and permanently preserving the cytological details in aceto-carmine preparations. It is rapid and convenient and has been found more satisfactory for our purposes than previous techniques.[1]

The preparation is made in the usual way[2] and sealed with vaseline or preferably paraffin. When the stain is satisfactory the slide is supported face down by two thin glass rods in a petri dish of a mixture of equal parts of xylol, absolute alcohol and glacial acetic acid until the cover soaks loose. The action of the reagent is hastened by first cracking off most of the paraffin seal with a needle and also by gentle agitation of the slide.

When the cover comes off (5 minutes to ½ hour) the slide is rinsed in the solution for 5 minutes, drained carefully and wiped free from mounting medium. It is then passed through two changes of a mixture of equal parts of xylol and absolute alcohol (5 to 10 minutes each), then through xylol (10 to 15 minutes) and mounted in balsam. The xylol stage may be omitted with minute objects such as pollen-mother cells. Occasionally part of the preparation adheres to the cover slip in which case cover and slide are run up separately and recombined in balsam. Preparations in the balsam improve in clarity for a week or more. Smears of pollen-mother cells (*Lilium, Podophyllum, Hyacinthus, Tulipa*) made in this way are unaltered 10 months after preparation. The method has been used successfully on smear preparations of Dipteran salivary glands (*Drosophila, Sciara,* blowfly).

Professor C. W. Metz and Miss Elizabeth Gay find the following modification equally as good as the above for paraffin-sealed smears of *Sciara* salivary glands: Soak off the cover in equal parts of 95 per cent. alcohol, clove oil and glacial acetic acid; 2 changes of 95 per cent. alcohol up to ½ hour; absolute alcohol 5 minutes; clove oil 10 minutes; xylol 5 minutes; balsam.

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SPECIAL ARTICLES

THE SIMILARITY BETWEEN FASCIATIONS IN PLANTS AND TUMORS IN ANIMALS AND THEIR GENETIC BASIS

A COMMONLY recurring abnormality in plants is the irregular development of the growing points of the main stem or branches called fasciations. These peculiar formations occur in many plant families and are particularly noticeable in species having an indeterminate type of growth. In some cases fasciated plants are able to reproduce and all the progeny show the same abnormality. In these cases the teratological development is due to one or more specific genes for abnormal growth and is definitely inherited. In many other cases fasciations occur only in one part of a plant. Such variations occur so sporadically both in seed and vegetatively propagated plants that they seem not to have any basis in inheritance, yet they appear more frequently in some germinal lines than in others. Gall formations occur in plants, and many of these are clearly due to insect, fungus and bacterial parasitism. In some galls no infection can be found and these seem to be a form of unregulated growth for which no adequate explanation has been made.

The tumors in animals that assume many different forms and occur in many parts of the body are also a form of unregulated growth. This abnormal development frequently starts in traumatic tissue. In both plants and animals the injurious nature of unregulated growth comes mainly in later stages from a breaking down of cells due either to pressure or to a failure of normal metabolism, resulting in secondary infections in necrotic tissue. Plants differ from animals in that there is no migration of abnormal cells to other parts of the organism starting new centers of growth. In plants there is no circulatory system whereby this transfer could be brought about. Fasciations and galls in plants do not show the malignant features characteristic of many tumors in animals.

[1] B. McClintock, *Stain Tech.*, IV: 53, 1929; W. C. Steere, *Stain Tech.*, VI: 107, 1931.

[2] Lee, "Microtomist's Vade-Mecum," p. 142, 9th ed., 1928; J. Belling, *Am. Nat.*, 55: 573, 1921; *Biol. Bull.*, 50: 160, 1926.