tion seemed unnecessary. The observations were made on an unanesthetized animal, restrained upon an animal board. The experimental procedure and chemical methods were similar to those used in observations on dogs.[1] The urine flow at which these observations were made varied from 0.82 to 2.20 cc. per minute.

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Application of Vital Dyes to the Study of Sheath Cell Origin.

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That the spinal ganglion cells and sheath cells of Schwann have a common origin in the neural crest, his been accepted generally since Harrison's original experiments in 1904.[1] When the dorsal portion of spinal cords of anuran embryos were removed (elimination of the ganglionic crest), the larvae lacked spinal ganglia and sensory nerves, and the motor nerves present were devoid of sheath cells. Recently Raven[2, 3] employing a different experimental approach assigns a cord origin to the sheath cells and claims that Harrison's conclusions were not justified, since in eliminating the neural crest he also destroyed the dorsal part of the spinal cord, thus not only removing such presumptive sheath cells as may originate there, but obstructing by deformation of the cord the dorsal migration of these elements which are supposed to lie in the ventral portion of this structure. Raven also concludes from his experimental results that sympathetic elements arise from both neural crest cells and from the ventral portion of the spinal cord. His findings do not support those of Müller and Ingvar[4, 5] and Van Campenhout[6] who claim a neural crest origin exclusively for sympathetic ganglion cells, but they do support in part those of Kuntz and Batson,[7] and Kuntz,[8]

1 Harrison, R. G., *Sitz. Ber. Niederrh. Ges. Natur. u. Heilkunde*, 1904, Bonn (*v.* also Harrison, R. G., *J. Comp. Neur.*, 1924, **37**, 123).

2 Raven, Chr. P., *Arch. f. Entw.-mech.*, 1936, **134**, 122.

3 Raven, Chr. P., *J. Comp. Neur.*, 1937, **67**, 221.

4 Müller, E., and Ingvar, S., *Upsala Läkaförenings förhandlingar Ny följd*, 1921, **26**.

5 Müller, E., and Ingvar, S., *Arch. f. mikr. Anat. u. Entw.-mech.*, 1923, **99**, 650.

6 Van Campenhout, E., *J. Exp. Zool.*, 1930, **56**, 295.

7 Kuntz, A., and Batson, O. V., *J. Comp. Neur.*, 1920, **32**, 335.

8 Kuntz, A., *J. Comp. Neur.*, 1922, **34**, 1.

and Jones,[9] who assign a neural tube origin for the sympathetic elements.

Raven interchanged trunk neural crest and also median part of medullary plate (future ventral portion of spinal cord) between embryos of *Amblystoma mexicanum* (axolotl) and *Triton taeniatus* (xenoplastic grafts). Axolotl (donor) cells in Triton embryos could be recognized by their larger nuclear sizes. Employing variation curves for nuclear size difference in both donor and host cells, Raven employed statistical methods in the analysis of his results. Although he obtained evidence for a dual origin of sympathetic ganglion cells, he says that the sheath cells of Schwann are derived exclusively from the tube. These cells are regarded as originating chiefly from the ventral portion of the cord, and he assumes that they migrate out either along the dorsal or the ventral roots of the spinal nerves.

The problem has been further investigated by the author using vital dyes in the following manner, (1) the median portion of the medullary plate of Amblystoma embryos (stages 14-15) was stained with Nile blue sulphate, (2) the corresponding trunk neural crest was likewise stained, and (3) the median portion of the plate was stained with neutral red, and the corresponding crest was stained with Nile blue. The stain was applied to the desired region of the embryo by means of appropriate sized pieces of cellophane previously impregnated with the dye. In several hours the dye was transferred from the cellophane carrier to the embryo, resulting in a brilliant blue or red stain respectively. The embryos were kept to stages 35-40 when they were fixed according to the method of Stone[10] for the preservations of the dyes.

Microscopic examination of such vitally stained embryos gave no evidence that the early sheath cells originate from the ventral part of the spinal cord. When this portion of the cord was stained blue, the cells of the spinal ganglia and the sheath cells possessed the natural brownish yellow pigment characteristic of the unstained neural cells.

In staining the neural crest, it has so far been impossible to obtain any embryos without some diffusion of the dye into the very dorsal part of the cord. Whereas the spinal ganglion cells and the sheath cells in such cases were correspondingly blue, the experiments so far have not been sufficiently conclusive to say whether

[9] Jones, D. S., *Abstract. Wistar Institute Biobliographic Service,* No. 297, October 15, 1937.

[10] Stone, L. S., *Anat. Rec.*, 1932, **51**, 267.

the colored sheath cells take origin from the stained neural crest as do the ganglia or whether they originate from the dorsal part of the definitive cord *per se,* which also possessed some blue stain. If the sheath cells take origin from the ventral portion of the cord and migrate out by way of the ventral roots, then sheath cells possessing the natural unstained brownish pigment should be seen. Their absence in such preparations is evidence that they do not originate from this source in early embryos. That they could not have migrated out by way of the dorsal roots is also obvious from the fact that the embryos were studied prior to the development of sensory roots.

In spite of the want of definite proof there are some indications of a common origin (neural crest) for spinal ganglion cells and the early sheath cells. This is based on evidence of a lateral and ventral migration of stained crest cells across the mid-dorsal line indicating that spinal ganglion cells and the sheath cells on one side may have their origin, at least in part, from the contralateral stained crest. It is hoped that experiments which are in progress will yield more decisive results. The evidence so far obtained by this method does not lend any support to the view that the early migrating sheath cells take origin from the ventral or lateral portions of the spinal cord. Further, it does not disprove that the sheath cells in later stages may come from this source.

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Virus Isolated from Nasal Washings during Acute Poliomyelitis in New York City in 1935.*

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The virus of poliomyelitis has been infrequently detected in the nasal secretions of patients during and following an attack of poliomyelitis. We have reviewed the literature and considered that until the summer of 1935 when this study was begun, the virus had been isolated from human nasopharyngeal secretions only 11 times.[1-7]

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1 Kling, C., Pettersson, A., and Wernstedt, W., *Communications de l'Institut Medical de l'État a Stockholm,* Tome III, 1912.