understanding the different textures found in igneous rocks and the relation of each to relative rates of cooling necessary to produce them.

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USE OF NILE BLUE SULFATE IN MARKING STARFISH[1]

THIS method was developed by the writer in the summer of 1935 and has been used very successfully for the past two years in his studies of the migration of starfish population of Long Island Sound and in connection with other problems where the marking of the individual starfish was desired.

The method consists in immersing living starfish in a solution of Nile Blue Sulfate for a short period of time. The solution is prepared in the following way: One gram of Nile Blue Sulfate is dissolved in a small volume of distilled water and then diluted with sea water to make up one liter of solution. If a large number of animals is to be stained at the same time, it is more convenient to prepare about 10 liters of solution at once. Dr. G. Gruebler and Co.'s Nile Blue Sulfate gives the best results.

When the solution is ready the starfish are placed in it. To avoid the suffocation of animals the solution should be aerated. The normal starfish (*A. forbesi* and *A. vulgaris*) are usually of orange-red color. After being placed in a freshly made solution of the dye, the animals acquire a very deep blue color in from 3 to 5 minutes, but as the solution weakens, longer immersion is necessary. According to my experience it is possible to stain several hundreds of medium-sized starfish, using one gram of the dye. The method can be used equally well for the marking of small or large starfish. Small, rapidly growing starfish, however, retain the color for considerably shorter periods than large ones. In the studies of the migration of starfish population of Long Island Sound, many large starfish were recovered 10 months after they had been stained and released in the Sound. At the end of the 10-month period the blue color was considerably faded but still quite deep.

In experimental work occasion often arises when each starfish has to be marked so as to be distinguishable from all other animals used in the same experiment. In such cases, the Nile Blue Sulfate method is indispensable because of the simplicity of its use. Any ray or any portion of the starfish's ray can be quickly stained by immersing it in the solution of Nile Blue Sulfate for several minutes. The stain is localized in the immersed part of the starfish and does not spread over the entire animal.

[1] Published with the permission of the U. S. Commissioner of Fisheries.

The simplicity and efficiency of this method is readily apparent if it is remembered that the self-mutilating tendencies of starfish prohibit the use of any other method of marking such as attachment of tags or cutting off portions of the rays.

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A PORTABLE HOOD FOR SMOKING KYMOGRAPH DRUMS

MODIFICATIONS of the apparatus described by Williams[1] in SCIENCE produced a portable hood which is fully effective at a cost of $7.00.

An end board of the proper dimensions was removed from a tight packing box, the dimensions of which were 27″ × 17″ × 16″. Over this aperture was placed an older model dismantled Hoover sweeper. A sheet of tinplate, 7½″ × 16″, was fastened across the top portion of the open side, and the box was entirely lined with tin. The original plan called for a hose through which the smoke could be expelled. Great was our satisfaction to find that the sweeper's sack would retain all carbon, even if benzene were used!

Increases of one or two inches in the above specifications should not adversely alter the effectiveness of the apparatus. Experience shows that decreases are not to be recommended.

The Hoover sweeper is peculiarly adapted to this work because of its wider suction opening. Sweeper companies resell used machines of the vintage in question, after reconditioning the motor, for $6.00.

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[1] G. W. Williams, SCIENCE, 81: 2106, 465–466, 1935.

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