they were represented by the composite Botryllidæ, which could be had in immense numbers in some of the shallower parts at the entrance of the Zuyder Zee, mostly attached to blades of the *Zostera*. The stones employed in the construction of the great dyke, which are partly lying loose, were of importance, as they usually covered over the haunts of numerous Crustaceans, Nemerteans, &c. A no less rich harvest was got from the driftwood now and then met with, and from the wooden palings serving in the construction of the wharfs, &c., in the harbour, which were submerged at high tide.

Altogether this first summer of the Dutch Zoological Station gave ample proof of its practicability. It would perhaps be a good idea to act conjointly in future with the German men of science, and to add a third permanent station to those proposed in the German Committee's Report (Kiel and Heligoland), say at Flushing. If, then, one other station were to be erected on the English or Scotch coast (St. Andrew's Bay?), a conjoint attack could be made on the mysteries still hidden in that part of the ocean which is inclosed by our neighbouring coasts. The healthy competition which would arise out of this division of the work to be done, can only be favourable to the common end—an accurate knowledge of the natural history of our own seas, and a constant opportunity of studying their animal and vegetable productions in the fresh state.

SENSITIVE FLAME APPARATUS FOR ORDINARY GAS PRESSURE, AND SOME OBSERVATIONS THEREON

A GLASS or metallic tube, about 5 inches long, and $\frac{1}{4}$ in diameter, is closed at one end with a perforated cork, through this cork slides a piece of $\frac{1}{8}$ inch tubing, about 6 inches long. One end of this is either drawn out to a jet, or closed in the blow-pipe flame to reduce its diameter to about $\frac{1}{16}$ inch, and the other end is connected to a gas supply. (Fig. 1.)

The outer tube is held in a suitable support, and the inner tube is pushed through the cork till it nearly reaches the mouth of the outer one, and a light then applied. It now gives a long steady flame.

Experiment I.—Lower the inner tube till the flame is on the point of roaring. It will now be found very sensitive to noise. Snapping the fingers at a distance of eight or ten yards will cause it to contract fully $\frac{1}{2}$ of its height. The most suitable flame for this is about 6 inches high.

Experiment II.—Adjust the gas to give a flame of about $4\frac{1}{2}$ inches high, and gradually raise the inner tube. A point will be reached at which the flame becomes sensitive, not to noise, but note; and it will be found to respond to a certain note by dividing into two portions, and while this note is produced it will continue divided. It is difficult to keep the exact note by whistling with the mouth, and therefore a glass whistle with paper slider should be used, or, better still, a singing tube with adjustment.

Experiment III.—Arrange two singing tubes to give the responding note. The flame divides. Now make one tube a little sharper than the other, so as to beat slowly. The alæ of the flame alternately recede and coalesce.

Experiment IV.—Using the whistle; blow it so hard

as to produce higher octaves of the responding note. The flame will be unaffected, as though in perfect silence.

The dimensions of the instrument are open to great variation, and also the size of the flame. For lecture work, a flame $1\frac{1}{2}$ or 2 feet would be more suitable, though less sensitive, and neither dividing nor shortening so perfectly as the sizes given above. It will act effectively with any pressure of gas, from $\frac{1}{10}$ inch (of water) upwards, and the sliding jet makes it equally sensitive with a large or small gas supply.

Observations on the Escape of Gas from Contracted Openings, and on a Differential Pressure Indicator.

Glass tubes of about $\frac{1}{4}$ in. bore are joined as shown in Fig. 2. At D the tube is slightly bent so as to retain a little drop of water. The gas enters at C, and then divides into two channels, one towards B, the other towards A.

FIG. 2.

If one of the exits be contracted, say B, then the water moves towards A. Certain precautions have to be observed, the conditional arrangements of which need not be mentioned here.

Experiment I.—Connect to each, A and B, a tapering jet, and C with the gas supply. Get the water stationary. Now light, say, B, the water will move towards A, showing that the exit of the gas is retarded by being ignited.

This is rather a remarkable result, seeing that the gas is hotter, and therefore more mobile, and also that the heat must enlarge the aperture. Now light A, and the water will return to zero.

Experiment II.—Connect B with a sensitive flame apparatus, A remaining as before, light and adjust to zero. Now sound the responding note and the water moves towards A, showing that the outflow of gas is retarded by a certain note. Now adjust the sensitive flame for noise, and rapidly snap the fingers or stamp the foot, and the water will still move towards A.

Experiment III.—Arrange as in II., then extinguish the sensitive flame and readjust to zero. Produce the responding note, and the same movement of the water will be observed. This shows that an issuing jet is affected in the same manner by a sound, whether ignited or otherwise.

Experiment IV.—Fix the sensitive flame apparatus adjusted for note under a large jar open at both ends. A large stoppered gas jar answers very well. Fix three balls of spongy platinum, a, b, and c, upon a piece of thin platinum wire so that the point of the quiescent flame just reaches b, and the points of the responding flame reach a and c respectively. Now extinguish the flame without turning off the gas. The issuing gas will cause the ignition of b. Now sound the responding note, and b will cool, and a and c will be ignited. This confirms the previous observations, and forms a rather pretty lecture experiment. The object of the gas jar is merely to protect from air currents.

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