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WORDS AND SENTENCES IN SCIENCE AND INDUSTRY[1]

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COOPERATION is the main highway of human progress. The use of words and sentences is the commonest vehicle traveling this highway. Too often this vehicle of cooperation shows the need of lubrication. Too often it breaks down. Its utility is none too good at best, for the indefiniteness of words, as used and as understood, limits communication tyrannically. The failure of our communication vehicle continuously to function smoothly is not surprising; the imparting of information and ideas by the enunciation or writing of words and sentences is really a most complicated procedure. An ordered and modulated series of sounds is made in a well-nigh infinite variety of combinations, and listeners frequently understand. Marks are rapidly made one after the other on some surface, and readers find meaning in them. Because the ability to talk or write and to gain information by listening or reading is common the remarkability of this distinctive human attribute is not generally realized. Because the use of words and sentences is universal, adequate capability in their use tends to be taken for granted.

Science is exact. Industry is exacting. Men in science and industry therefore have special need for skill in clear and accurate communication one with another.

Mathematics is a language. Like a sentence a mathematical equation conveys a complete thought. So does a chemical equation. Scientists work with these languages and in these distinctly scientific modes of expression they recognize the necessity for the use of correct symbols and for proper balancing of equations.

Words are symbols, too, and sentences, like equa-

[1] Address delivered in New York, on November 5, by the recipient of the Chemical Industry Medal for 1937 presented by the American Section of the Society of Chemical Industry.

We have used common nails with complete success and have found that the following sizes are the most convenient for the experimental animals designated: for old mice, rats, etc., 16 penny (3½ inch) nails; for guinea pigs, rabbits, ground squirrels, etc., 30 penny (4½ inch) nails; and for ferrets, monkeys, woodchucks, etc., 60 penny (6 inch) nails.

The procedure of intracerebral inoculation, as routinely carried out in our laboratory with the instrument just described, is as follows. The site to be inoculated is usually in the parietal region overlying the right cerebral hemisphere, midway between the external canthus of the right eye and the external occipital protuberance. Following anesthetization of the experimental animal and suitable preparation of the skin, a small incision is made through the skin a short distance to one side of this mid-parietal site. The point of the instrument is inserted through the skin incision, the scalp is retracted with it, and the skull is penetrated at the site described. The point of the instrument is left in place in the skull and the needle of the syringe containing the suspension to be injected is slid along the groove until, penetrating the skull beside the point, it enters the cerebral cortex. The desired amount of inoculum is injected, and the needle and the instrument are withdrawn together. Following withdrawal, the retracted skin, by immediately rebounding, provides a satisfactory covering for the opening through the skull.

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FILTER-METHOD FOR CLEAN ISOLATION OF TRICHINELLA-LARVAE

IT is well established that Trichinella-larvae having entered the stomach move to the small intestines of the host in order to invade instantly the mucous membranes. The following procedure makes use of this activity of the larvae as it is done in the Bearman-method.

The neck of a glass funnel is transversally cut and a perforated rubber stopper slipped over the stump in order to hold a test-tube (centrifuge) in a water-tight position. The funnel rests on a tripod ring (see Fig. 1). A cylindrical fruit (Mason) jar, smaller in circumference than the funnel, a fitting glass cover, four layers of gauze and a rubber stopper (the latter in order to close the inner opening of the funnel, if desired) may be kept ready.

For use, both funnel and test-tube are filled with tap water (2 per cent. sodium chloride solution is preferable). Thoroughly minced Trichinella meat is mixed with digestion fluid and filled into the jar. Its

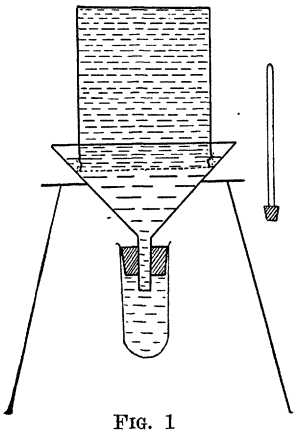

FIG. 1

top is then covered with four layers of gauze, which is tightly ligated around the rim. The glass cover is now pressed against the gauze filter and the jar placed upside down into the funnel. After the cover has been cautiously removed the jar rests in an upright position in the funnel. The apparatus remains undisturbed in the incubator.

After completion of the digestion the glass cover is inserted, the jar removed, the inner opening of the funnel closed with the aid of the rubber stopper, and the fluid in the funnel decanted. More recently we omit the use of glass cover and rubber stopper for these operations without disadvantage. The sediment in the test-tube contains the total amount of living Trichinellas of the digested meat free from coarse particles. Further operations follow the ordinary methods.

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BOOKS RECEIVED

ANDERSON, WILLIAM B. *Mechanics and Heat.* Third edition. Pp. ix + 378. 226 figures. *Sound, Electricity and Magnetism, Light.* Third edition. Pp. x + 361–796. Figures 227–534. McGraw-Hill.

AUSTIN, E. E. *Bombyliidae of Palestine.* Pp. ix + 188. Illustrated. British Museum (Natural History). 15s.

BENEDICT, FRANCIS G. and ROBERT C. LEE. *Lipogenesis in the Animal Body, with Special Reference to the Physiology of the Goose.* Pp. vi + 232. 30 figures. Carnegie Institution of Washington.

MELANDER, LEONARD. *Source Book of Biological Terms.* Pp. 157. College of the City of New York. $1.10.

NORMAN, J. R. *Illustrated Guide to the Fish Gallery.* Pp. x + 175. 100 figures. British Museum (Natural History). 1s, 6d.

ROBERTS, MICHAEL. *The Modern Mind.* Pp. 284. Macmillan. $2.75.

The Collected Papers of George Ashley Campbell. Pp. xii + 548. Illustrated. American Telephone and Telegraph Company, New York.