similar time-saving devices, due to complication of the mechanical technique.

In order to overcome these difficulties, we have tried to perfect a new coordinator (Fig. 1) which would (a) guarantee a long life for the electrode; (b) produce as few artifacts as possible; (c) guarantee segregation of the electrodes; (d) provide a permanent and yet accessible place of storage when not in use; and (e) allow the electroencephalographer a free, unobstructed view of the patient's head during the recording.

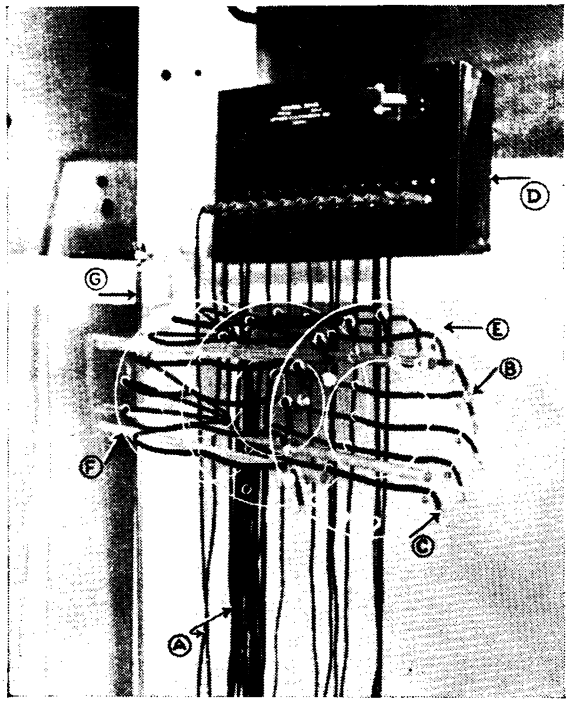


FIG. 1

The type of "wire" used for mechanical and electrical attachment to the electrode is that known as "tinsel wire" (A), consisting of a fabric sleeve-covered cord made up of strands of linen thread on which have been spun fine ribbons of copper. These strands are woven together to make a continuous, well-insulated cord of great strength and flexibility which has the same electrical characteristics as the type of solid wire generally used. The tinsel wire is bonded inside the soldered pellets (B) and sealed at the point of entry by an acetone-resisting tape (C), which insures the positive seal against corrosive elements, particularly acetone used in the technique commonly employed. The other ends of these wires are attached by "heat bonding" to plugs inserted in the terminal board (D) of the electroencephalograph. Since components of these plugs are removable without disturbing the bond to the wire, the wires may be removed or installed at will.

The heavy-weight factor of tinsel wire has been remedied by the use of a carrier or support, consisting of three circular flanges of ⅛-inch flat lucite (E), supported in parallel, on vertical planes 6 inches apart, by a bridge of four lucite rods (F). The base is mounted on a vertical shaft (G) fastened to the frame of the cage. Thus, the whole contrivance is adjustable on a horizontal and vertical plane.

Each circular flange has 18 or more holes equidistant around its circumference so that the wires for the electrodes can be passed through the flange. These holes are large enough to permit free passage of the wires so that the ends to which the electrodes are attached may be extended through the vertical plane of the face flange to any desired length to fit the patient or adjust themselves to any sudden move of the patient. They can also be retracted easily, the electrodes then resting against the flange.

The other ends of the wires extend through the rear flange and are segregated to their various positions by means of the banana plugs attached. Approximately 4½ feet of slack is left to insure free movement through the bridge.

The numbers on the face flange, which segregate the electrodes, have been inscribed with India ink so that they can easily be removed and changed to suit different techniques.

Our electrodes have given extremely satisfactory recordings for 100–120 tracings, and some have lasted for over 140 recordings; no electrode had to be replaced prior to 100 applications. Unaccountable time was saved by avoiding the entanglement of electrodes and replacing those broken during the electroencephalographic process.

The type of wire used by us was tested in the laboratory. Most of the strands parted near the center of the cord at an average pull of 13.5 kg. The cord had not changed characteristics of conduction up to that point because the mechanical construction of the cord prevents any longitudinal stresses on the metallic strands. In further tests the cord withstood a 90° bend for an average of 250 times. Comparing the commonly used #29 solid, copper-enameled wire with electrode attached, we found that the wire parted at a maximum weight of 1.7 kg. at the point of entry to the electrode. This wire withstood a 90° bend only 5 times before breaking. It was also noted that the wire had changed characteristics due to stretching long before the maximum weight was reached. The measurement of the electrical resistance from the tip of the electrode to the tip of the plug on the end of the wire revealed .25 ohm for both types of electrode wires. Other electrical attenuation factors were negligible.

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## Briquettes With Labels

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Detailed directions for the preparation of methyl methacrylate (lucite, crystallite, plexiglas, acryloid) briquettes accompany the laboratory presses especially designed for their production. In order to prepare a briquet in which a label has been inclosed it is necessary to modify these directions. The advantage of inclosing the label along with the specimen should be obvious: a number scratched into the plastic is

more difficult to prepare and decipher, while a neatly typed label on an ordinary white filing card is more readable and much easier to prepare.

The powdered acrylic resin is given an initial pressure of nearly 250 pounds. The resin is then heated to 125° C. When this temperature is attained, a pressure of 4,000 pounds per square inch (1-inch mold) is applied before removing the heater. This final pressure is maintained throughout the cooling period. The briquet is driven out at 75° rather than at 80° C.

Opaque, white, cloudy spots usually form if the older directions are followed with the label insert. The spots result from the retention of the inhibitor, which is readily driven off in spite of the label providing no pressure is maintained during the heating period.

## Ultraviolet Radiation as a Means of Sterilizing Tissue Culture Materials[1]

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The efficacy of ultraviolet radiation of wave length 2,537 A. in killing bacteria, fungi, and viruses has been adequately demonstrated (*1*). It can be used, therefore, under certain conditions as a substitute for heat sterilization. If it is to be effective, however, certain requirements and limitations must not be overlooked. For sterilizing solutions containers of clear, transparent, fused quartz or of special glass transmitting wave length 2,537 A. must be used, because pyrex, plastics, and ordinary glass absorb this wave length. The surfaces of these containers and of dissecting instruments, slides, and cover glasses to be sterilized must be free of any extraneous matter that will absorb ultraviolet, and must be arranged in such a way in relation to the radiation source that all parts requiring sterilization are exposed to the radiation. Solutions must not contain in high concentration constituents that absorb appreciable amounts of ultraviolet radiation of this wave length, e.g. many organic substances—particularly proteins and sterols—as well as certain inorganic compounds. Solutions in which these substances are present in low concentration can be sterilized by rotating the flask in such a way that all parts of the solution receive similar amounts of ultraviolet energy. Spectrographic analysis of our three concentrated stock solutions[2] fails to indicate any significant absorption of wave length 2,537 A. to a depth of 1 cm.[3]

[1] This work was supported in part by a grant from the University Research Committee of the University of Alabama.

[2] Solution A: 7 per cent NaCl, 0.2 per cent KCl, 0.2 per cent $CaCl_2$, 0.1 per cent $MgCl_2$, 0.2 per cent $NaH_2PO_4$; Solution B: 0.12 per cent $NaHCO_3$; Solution C: 8 per cent dextrose. These constituents, if combined in a single concentrated stock solution, will undergo chemical reaction and precipitation after a short storage period. If kept in three separate solutions, however, and stored in a refrigerator, they will remain usable for a long period. Our dilute, ready-to-use solution consists of 1 part of each of Solutions A, B, and C to 7 parts of water.

[3] We are indebted to Mrs. Dorothy C. Peterson, of the National Institute of Health, for this analysis.

In sterilizing physiological salt solutions, ultraviolet radiation has a number of advantages over heat sterilization. First, there is no loss of water through evaporation and no consequent increase in osmotic pressure. Second, heat-induced chemical reactions between the constituents of the different stock solutions, viz., certain inorganic salts and dextrose, are

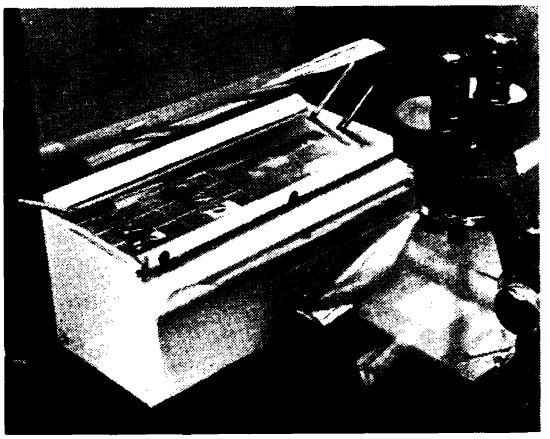

Fig. 1. Exterior of sterilization box, showing dissecting instruments, cover glasses, and slides in position for sterilization.

eliminated; therefore, sterilization can follow mixing and dilution. This dilute solution will remain stable at room temperature for at least several weeks if sterilized with ultraviolet after each opening of the container. Third, unsterilized pipettes

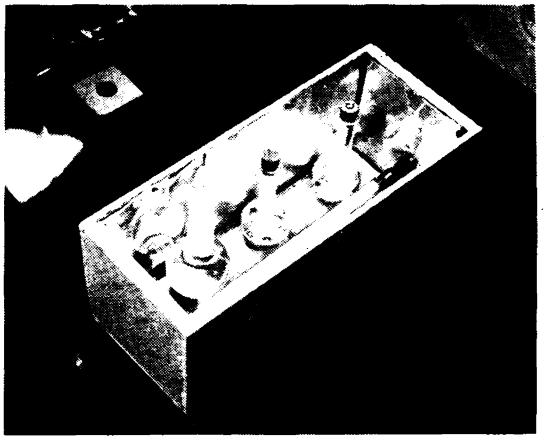

Fig. 2. Interior of sterilization box, showing aluminum lining, ultraviolet lamp, and solutions in quartz flasks.

can be used in making the dilution, for asepsis can be accomplished quickly by subsequent irradiation of the final solution, and the stock solutions can be readily resterilized with ultraviolet after opening. Fourth, the whole method is simpler and less time consuming than autoclaving, irradiation for about 5 minutes being sufficient. It must be remembered, however, that excessive exposure of some substances to ultraviolet produces chemical changes.

Our device is shown in Fig. 1. The transparent shield that covers the box containing the ultraviolet lamp protects the