clonal metabolism. For these reasons, it was believed that the best indication of the relative rates of growth in any one concentration would be the mean number of tentacles present; these are graphed as the logarithm against the time in hours (Table 1).

The results, as illustrated by Fig. 1, indicate that

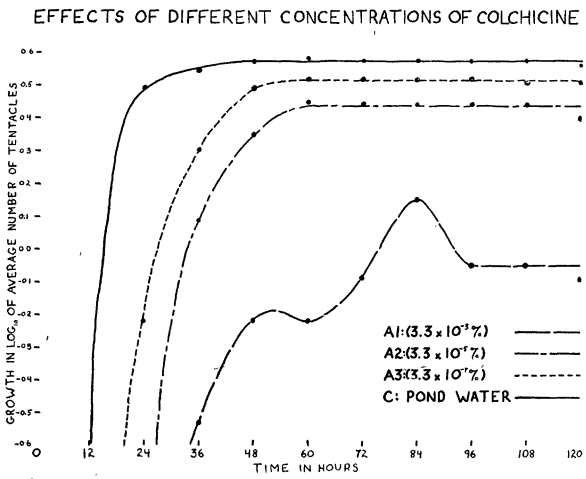

FIG. 1. Effects of different concentrations of colchicine.

the degree of inhibition of regeneration is a direct function of the concentration of colchicine. This agrees with the results of Bernhard on *Rana* (*8*), although he also obtained abnormal morphogenesis in regenerating tails.

The rates of regeneration as seen in Curves A 2 and A 3 appear to be depressed from the control (Curve C) by the toxicity of the alkaloid. Curve A 1, however, displays irregularities when compared to the other three. The distinct lag in absolute and relative growth rates seems to have been caused by stathmokinesis in conjunction with alkaloidal toxicity.

To test this hypothesis, cytological analyses were made. These examinations revealed, first, the fact that all the hydra (experimental, control, and nonexperimental from the same clone supply) showed polysomaty.[1] Second, an actual count was made comparing 2 regenerated sections (120-hr) from 0.0033% colchicine with the water controls, as to number of metaphases and anaphases. The following results per regenerated segment were obtained: control, 6 metaphases and 6 anaphases; colchicine-treated, 33 metaphases and 17 anaphases. In general, more mitotic figures were seen in the experimental animals, with a higher percentage of prophases being found in the control.

Therefore, the greater proportion of mitotic figures in the colchicine-treated specimen, as compared to the water control, indicated that the latter had completed the period of rapid growth in regeneration, whereas the former had not. The excess number of metaphases in the colchicine-treated specimen was visible proof of the effectiveness of the stathmokinetic properties of colchicine on animal cells. These results are in harmony with the observation of stathmokinesis in *Arbacia* eggs, mentioned above (*5*).

[1] Discovered by G. H. Mickey, of Northwestern University.

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The Use of a Precision Lathe in the Preparation of Biological Thin Sections

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Through the use of a small precision lathe of the type used by jewelers and instrument-makers it is possible to prepare sections of biological materials by a technique similar to that employed in the preparation of plywood.

The basic techniques and equipment for such a method are fairly simple. Biological materials to be sectioned are embedded in the usual manner in paraffin, and the trimmed block is mounted on the face of a suitable wire or wheel chuck. In order to affix the block to the chuck the latter is heated slightly, the block is pushed onto it, and both are cooled in water.

By means of an appropriate set of pulleys the speed of the lathe is reduced to approximately that of a rapidly operated microtome. The speed can be increased as the operator's technique improves. The cutting tool, which can be a simple razor blade mounted in a holder of the type used in removing paint from glass surfaces, is held firmly against the tool rest of the lathe at an angle corresponding to that used for the knife holder of a conventional rotary microtome. It is imperative that the cutting tool be held firmly against the tool rest and the block in order to prevent vibrations that would ruin the ribbon.

This technique affords a means of preparing conventional transverse and longitudinal sections in addition to "peeled" or veneer sections. If the long axis of a tissue specimen be mounted perpendicular to the axis of rotation it is possible to remove anterior and posterior transverse sections alternately. Longitudinal sections may be obtained by mounting the specimen eccentrically in the block, but with its long axis parallel to the axis of rotation. If longitudinal sections of the entire specimen are desired the material must be so placed as to be removed completely from the rotating center of the spindle.

It should be possible to peel completely a perfectly cylindrical specimen by this technique and, in the case of forms showing concentric growth patterns, to obtain a histological "spectrum" of the tissues composing

the "peeled" organism. In order to obtain such a preparation, however, it is necessary to mount the specimen so that its center exactly corresponds to the rotational axis of the lathe.

The technique is not restricted to use in the preparation of paraffin sections. Celloidin embedments mounted on wooden blocks in the conventional manner can readily be attached to screw-center chucks and sectioned longitudinally or transversely. By means of this procedure the routine sectioning of celloidin materials may be greatly accelerated.

The author has prepared only a limited number of materials by this method, but it seems to offer unique advantages to the biologist. It should be of particular value in the preparation of materials exhibiting concentric growth patterns or elongate cylindrical morphology. It has been employed to advantage, however, in the preparation of spherical sarcodinian protozoa for cytological study and should find ample development in other cytological investigations in which structural relationships of component tissues or cellular elements are not of prime importance.

The technique is capable of considerable refinement and must, indeed, be so refined if it is to become a routinely valuable one to the scientist.

Subcutaneous Implantation of Cortisone Pellets in Rheumatoid Arthritis

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Cortisone has been shown (*1–4*) to be useful as a palliative in rheumatoid arthritis when injected in aqueous suspension and when given orally. Wide experience with other steroids administered in the form of pellets implanted subcutaneously shows that excellent utilization is the rule. In the case of desoxycorticosterone acetate pellets used in the treatment of Addison's disease, constant absorption from the steroid depot created by pellet implantation exerts a physiologic effect that is sustained for many months. When comparable studies are made in the same patients it has been shown that the efficiency of 1 mg desoxycorticosterone acetate absorbed from pellets is about twice that of 1 mg absorbed from daily intramuscular injections (*5, 6*). Thorn and co-workers (*7*) found this to be true of cortisone pellets in patients with Addison's disease. From 3 to 10 pellets weighing 50–80 mg maintained the patients in good condition (under average demands) for 3 months, without observable biochemical disturbances.

It was deemed advisable to appraise the effect of cortisone pellets in patients with rheumatoid arthritis in the course of other studies we were carrying out with this drug (*8*). Eight adult patients with typical rheumatoid arthritis of severe grade received subcutaneous implantations of 900 mg cortisone as 12 pellets of 75 mg each. In four of the cases no cortisone in any form had been given previously. Four had been receiving cortisone by daily intramuscular injection for varying periods of time prior to the implantation and had also been receiving cortisone plus insulin.

Prompt clinical improvement of moderate degree followed the implantation and was sustained for 2–4 weeks, whereupon all the patients (except one) relapsed to their pretreatment condition. The exceptional patient was a man, H. C., aged 49, in Stage IV (*9*) of the disease, who had sustained a minor improvement with cortisone plus insulin, relapsed somewhat during 2 weeks without treatment and was then maintained in an improved state for 4 months after the implantation of pellets. In view of the long duration of "benefit," it appears probable that the disease had temporarily become quiescent from other causes.

Marked euphoria developed in one woman, C. W., who experienced her first epileptic seizure in 9 months one week after receiving the implantation. This patient enjoyed the most outstanding improvement, which continued for 3 weeks. The next best result consisted of moderate improvement in one woman, E. C., lasting 3 weeks. Four patients benefited slightly for one week after the implantation, and one woman, M. F., was not improved significantly.

It is of interest that the pharmacologic actions of cortisone by pellet implantation are of remarkably short duration in patients with intact adrenal cortices, in contrast to those with Addison's disease. Notwithstanding the low solubility of cortisone (as the acetate), the prolongation of action as with other steroids in pellet form is not achieved; the procedure more nearly resembles a short-term, intensive therapy.

It is our feeling that the patients were undertreated, even though most of them exhibited some manner of response. A new group is receiving twice the dosage discussed here; results will be reported later.

[1] The authors wish to express their sincere thanks to Christopher J. Reilly, attending surgeon, St. Barnabas Hospital, for his kind cooperation.

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