Comments and Communications

How Does the Ivy Grow?

At commencements and "homecomings," when college students and visiting grads return to their ivy-covered colleges, the question is occasionally asked: "How does the ivy manage to cover buildings with uniform coats of bright greenery?" To answer this question, I measured the rate of growth of a single shoot of ivy growing on the east window of a Harvard house. The following data were recorded between June 8, 1950, and June 12, 1950. Measurements were made with a millimeter rule at 12-hr intervals.

Date	Shoot length (cm)	Growth (cm)
6/8	2.0	—
6/9	6.5	4.5
6/9	10.5	4.0
6/10	13.8	3.3
6/10 (rain)	18.0	4.2
6/11	21.5	3.5
6/11	23.0	1.5
6/12	25.0	2.0

Thus, for a typical 12-hr period, the rate averaged 0.375 cm/hr during the first 2 days of recorded growth and approximately half this rate during the last 2 days of recorded growth. These incidental observations may help to explain the phenomenal rate at which ivy covers buildings. At an approximate rate of 0.5 mm/min, one can practically see it grow.

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Training Leaders in Science and Religion

Two recent studies have designated liberal arts colleges as the most fruitful source of American scientists (*1*). This position of leadership can hardly be ascribed to the research interests of these institutions, for only 13 liberal arts colleges of the first 50 institutions listed by Knapp and Goodrich published any research in the *Journal of the American Chemical Society* during the 15-year period 1927–41 (*2*). The colleges represented in this leading research journal totaled only 217 pages in the decade and a half.

A more significant relation is to be found in the high percentage of church-related colleges among the institutions leading in the training of scientists. Seven of the first 10 on the list of Knapp and Goodrich are church-related, and 24 of the 50 are listed by *The College Blue Book* (*3*) as church-controlled. Ten of the 14 leading colleges in Lewis' list (Table 4) are church-related.

Denominational colleges have long been recognized as the most fruitful training ground for religious leaders. Their position of distinction in the training of leaders in science is only now coming to light through these studies on the origins of American scientists. For those who are baffled by this unique relationship of religion and science a statement credited to the late Max Planck may provide food for thought (*4*): "Religion and natural science do not exclude each other, as many contemporaries of ours would believe or fear; they mutually supplement and condition each other."

References

1. Knapp, R. H., and Goodrich, H. B. *Science*, **113**, 543 (1951); Lewis, H. F. *J. Chem. Education*, **28**, 104 (1951).
2. Sampey, J. R. *J. Higher Education*, **20**, (4), 208 (1949).
3. Hurt, H. W., and Hurt, H. *College Blue Book*, Vol. V. New York: (1947).
4. The Faith of Great Scientists, *Am. Weekly* (1950).

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Gantt to the Rescue!

Dear Mr. Moneyed Man:

I deeply sympathize with your state of mind (*Science*, **113**, 333 [1951]), although I do not agree with you as to the facts. I am ready to spring to your relief without an instant's hesitation. I have the secret whereby your name can go down in fame, and the next generation will not even take the trouble to discriminate between you and Faraday and Keats.

Before I state my plan for relieving you of both your fameless state and your money, I beg the opportunity to correct some of your facts. It is true that a few European streets may be named for Helmholtz, Curie, and Pavlov, but what about the universities named for the moneyed men? Who was Johns Hopkins? Who was Duke? Who was Phipps? Who was Rockefeller? Who was Carnegie? Who was or is Du Pont? Who was Vanderbilt? Who was Smith? (Not the man with the long whiskers and the cough?) Who was Vassar? ("Brewer and Merchant.") Not one of them a scientist, but all suppliers of names and lucre to needy institutes. And who were Wells (Wells, Fargo), Bowdoin, Morgan (J. P.), Eastman, Ford, Diamond Jim Brady, etc. etc., *ad infinitum*?

In view of the stiff competition your colleagues have given you, naturally you feel discouraged. But wait a moment, do not become downhearted—the offer I am about to make you will quicken your step, make your heart throb, your face flush, and shake you in a way that was never done for poor, ailing, dreamy, drugstore Keats, Shakespeare, Galileo, or Newton. I have an immediate plan guaranteed to give you the fame that your brethren, mentioned above, have received, I am sure that they were once in your position, casting about frantically for some way to outdo the scientists—and they certainly have accomplished it.

Now, our laboratory is very much in need of a name like yours with big money. We will take part of the money—if there is enough—to buy a marble tablet, a portrait, a bust, an autographed photograph, an album bound in gold of some of the letters you have dictated, plus your name in big letters over the door and on every article, reprint, letterhead, and word of wisdom that issues from this laboratory. Wherever the human being, his conditional reflexes, neuroses, psychoses, are being discussed, your name will inevitably be tagged on.

This offer has a certain time limit. As the advertisers say, we cannot guarantee acceptance of your money unless you act at once. Other donors are on the alert, they have been animated by the same fear that stirs you (they get up early in the morning looking for universities to endow), and I cannot urge you too strongly to act immediately, as we will be forced to take the first and biggest donor that accepts this offer to go down in fame. I am already making plans to replace the present wooden sign with an appropriate marble slab. Owing to the great demand, there are not enough good laboratories and universities to go around. In order not to be disappointed, please act quickly. Your offer, to be considered, must not be signed anonymously.

Assuring you of our speedy cooperation in your plight,

Faithfully yours,
W. HORSLEY GANTT

Pavlovian Laboratory of the Phipps Psychiatric Clinic
Johns Hopkins University School of Medicine

P. S. Please use the self-addressed envelope (which needs no postage) for reply.

Lascaux Charcoal

WE HAVE noticed with great interest the comment of Don Ritchie (*Science,* **113**, 531 [1951]) concerning the identification of charcoal fragments from the Lascaux Cave, near Montignac, Dordogne, listed as sample #406 in the paper by Arnold and Libby (*Science,* **113**, 111 [1951]) on radiocarbon dates, where it was stated that the charcoal was ". . . of conifer *Abies* or *Larix,* neither of which grows in a cold climate." As Dr. Ritchie points out, this statement was made in error; it should have read ". . . neither of which is necessarily indicative of arctic conditions."

Subsequent analysis of the Lascaux sample by one of us (ESB) reveals that there is no reason to doubt that the wood is that of the genus *Abies* (fir). In all its details of structure this charcoal can be matched with the wood of *Abies pectinata* DC., the European silver fir. Structure of the torus of the bordered pits and the form, size, and number of the pits between ray cells and tracheids are identical with those of this species. The specimen consists of a small branch or stem with exceptionally narrow growth rings, indicative of very slow growth. It is more likely a branch than a young stem, in view of the prevailing orientation of the rays to the tracheids, these not being at right angles as is normal in erect stems.

Whether the charcoal is from the wood of *Abies pectinata* or some other species of *Abies* is not possible to determine for certain. In fact, it is extremely difficult, if at all possible, to determine as to species the wood, much less charcoal, of the various species of *Abies.* In view, however, of the present range and occurrence of *A. pectinata,* and the fact that the charcoal wood differs in no detectable way from this species, it seems reasonable to conclude that it is *A. pectinata.*

A. pectinata is widespread in the forests of central Europe, where today it forms a major component in the montane forests of parts of Germany, Austria, France, and the Swiss mountains. It occurs as far south as Corsica and the Pyrenees. The presence of this form in the Vézère Valley at the time the Lascaux Cave was occupied by late Upper Palaeolithic man indicates that a slightly more rigorous climate obtained than that now characteristic of this area, since the flora then contained elements thriving at present in the adjacent truly alpine regions. In terms of climatic tolerance *A. pectinata* is stated to have nearly the same degree of cold tolerance as the common European beech *Fagus sylvatica.*

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Stability of Disodium Adenosine Triphosphate[1]

RECENT reports on the stability of various preparations of ATP[2] have been conflicting. Bailey (*1*), using enzymatic methods of assay, found that metallic salts of ATP decompose on storage to AMP[1] and inorganic pyrophosphate, and to a lesser extent to ADP[2] and inorganic orthophosphate. Rowles and Stocken (*2*), who also employed enzymatic methods, found that a specimen of dibarium ATP stored at room temperature for over two years had formed inorganic pyrophosphate to the extent of 3%, as compared with a value of 41% for a comparable sample reported by Bailey.

A new approach to the analysis of adenosine polyphosphates has been developed by Cohn and Carter (*3*), who introduced the use of ion-exchange resins for this assay. In analyzing various commercial ATP preparations, these investigators noted that a tetrasodium salt, Na_4ATP, which had been stored at room temperature for six months, had decomposed practically completely to AMP, whereas a similar preparation, stored at $-35°$ C, retained a high ATP content. They state that the instability of the sodium salt of ATP has been noted by others and makes im-

[1] We wish to thank J. W. Williams, R. A. Alberty, and R. M. Bock, of the University of Wisconsin, for their cooperation in this work.

[2] ATP, adenosine triphosphate; ADP, adenosine diphosphate; AMP, adenosine monophosphate.