direction. A new type of genetics course might be developed in which elementary principles, physiological genetics and the application of genetics to the human being would be emphasized.

Another important point was briefly mentioned but not discussed at the Woods Hole meeting: The frequent complaint of medical school instructors that the college fails most seriously in the formal education of the students. Their faculty of logical reasoning and of independent thinking are not sufficiently developed. They are not able to draw simple conclusions from premises. They have not acquired the ability to express themselves concisely in words or in writing. I believe that these criticisms are by and large justified. The fault lies in part with our teaching methods. We are apt to apply without discrimination the methods of elementary courses to the junior and senior level, where they do not belong. A number of colleges and universities have gone a long way towards improving this situation, but much remains to be done. It is suggested that a new seminar or discussion type of an advanced course be designed in which the formal lectures are reduced to a minimum. Instead, the students would be guided to discuss and evaluate phenomena observed in the laboratory or demonstrated by slides; to formulate conclusions and explanations; to suggest further experiments, and to present short reports. In this way, an atmosphere can be built up in which the emphasis is not on memorized facts, lecture notes, examinations and grades, but on the satisfaction derived from independent thinking and the insight into the scientific method. The subject matter of such a course would be of secondary importance. We have had excellent results along these lines in a summer course organized in conjunction with Washington University Medical School, in which problems of growth, experimental embryology and developmental genetics served as the basis for the discussions.

VIKTOR HAMBURGER

WASHINGTON UNIVERSITY,
ST. LOUIS

SUPPRESSION OF VITAL DATA

THE publication of the results of research is intended to inform the world, and above all the scientists engaged in parallel investigations, of the progress made; that prestige attaches to priority in publication is relatively a trivial consideration. A claim for priority should be explicit enough to show belated rivals whether their work is still sufficiently different in method from that of the first-comers to be worth completing. The scientist is not bound to broadcast his hopes for the future of the research, nor to commit himself in print to beliefs not fully secured by experiment; on the other hand, he is, surely, not entitled to suppress uncontroversial facts that are essential to understanding and appraisal of his paper. Thus Hutchings and others[1] must have known, but did not mention, the source from which they isolated a new *Lactobacillus casei* factor; and though synthesis is not always an unequivocal proof of chemical constitution, SubbaRow and others[2] must have known, but did not mention, at least the starting point and procedures selected for their synthesis of a compound apparently identical with the *L. casei* factor from liver. It is not to be supposed that it was considerations of national security that dictated this omission of vital information. The columns of SCIENCE should not be open to communications of this kind.

D. L. THOMSON
H. E. HOFF

MCGILL UNIVERSITY,
MONTREAL

THE YALE CYCADEOIDS

ONE hundred years ago the famous Buckland finely illustrated the Dinosaurs and other ancient reptiles of South England. Also well illustrated, were low and bulky accompanying petrified plants correctly inferred to have some relation to "sago palms." These, however, were not well understood and remained relatively unstudied, as had isolated types from the Carpathians and elsewhere in Europe.

The final and inescapable incentive to acute structural study of the sago-palm relatives or "fossil cycads" was yet to come from the vast assemblage of specimens which came into view in the Mesozoic Rim of the Black Hills of South Dakota and Wyoming from 1893 on. It was presently found that counting the more isolated finds the Hills were girdled by occurrences of the fossil cycads, with some vertical distribution in the latest Jurassic and lowermost Cretaceous. The Dinosaurians were also found present in vast array.

Such an array could not escape that acutely aggressive assembler of paleontologic evidence, O. C. Marsh, of Yale. He at once made extensive purchases from local fossil hunters about the Hills. And then, when the dinosaur *Barosaurus* was collected at Piedmont by Wieland as Marsh's student, the "cycads" took on an immense meaning. The acute study was begun. The collections were signally added to, so that now the Yale collection of fossil cycads perhaps equals all other such collections put together. Their study, as extended to the more severely scientific viewpoints, has led to the publication of splendidly illustrated quarto volumes as brought out with the aid of the Carnegie Institution of Washington. Also, collateral

[1] B. L. Hutchings and others, SCIENCE, 99: 371, 1944.
[2] Y. SubbaRow and others, SCIENCE, 102: 227, 1945.