15 months period. I tabulated the values by successive lines of 15 months in length, and took means. The means of the columns indicated an irregular periodic fluctuation of about 0.0005 calorie in amplitude. As all the 14 periodicities enumerated in Table 31 of *Annals* 6 are nearly aliquot parts of 273 months, I thought it would be better to retabulate the values for a period of $\frac{273}{18}$ or 15.2 months. The resulting curve of this period was smoother than that for 15.0 months, and had a slightly larger amplitude. It then occurred to me to try a period of $\frac{273}{17}$, or approximately 16.0 months. And now I obtained the following series of mean values of the tabulation. The numbers below are given in units of $\frac{1}{10,000}$ calorie.

Month	1	2	3	4	5	6
Values	−62	−74	−74	−118	−158	−154
Month	7	8	9	10	11	12
Values	−180	−162	−144	−92	−70	−44
Month	13	14	15	16		
Values	−14	+40	+48	+13		

This defines a curve, which, as the reader may see by plotting the values, is very smooth, has its maximum at month 15, which corresponds to June, 1921, and minimum at month 7, which corresponds to November, 1920.

I have recomputed the 16-month period from unsmoothed values of the residuals "D." A slightly different and less perfect curve of about the same amplitude resulted. Recalling that "D" stands for *synthetic minus observed* solar constant values, and giving partial weight to the phases found in computations from unsmoothed data, I now set the initial dates of maximum and of minimum of the solar constant for the 16-month periodicity at October, 1920, and May, 1921, respectively. The amplitude, 0.00228 calorie, is 0.12 per cent. of the solar constant. This amplitude gives the new 16-month periodicity a standing of 1.7 times the importance of the periodicity of 9.79 months, and 1.3 times the importance of the periodicity of $8\frac{1}{3}$ months, as they are listed in Table 31, *Annals* 6.

C. G. ABBOT

SMITHSONIAN INSTITUTION

QUININE FROM REMIJIA BARK

A REPORT on cinchona exploration in South America recently appeared in your columns.[1] In this, surprise was expressed at finding in the bark of *Remijia pedunculata* "up to 3 per cent. of quinine sulfate (*sic*) with very little admixture of other alkaloids."

I should like to direct attention to the well-documented fact that this and related species of *Remijia* have for about seventy-five years been known to be quininiferous.[2] Indeed, for several years beginning in 1879 many thousands of tons of the bark of these trees were exported to Europe for the extraction of quinine. Most went to England, some being transshipped to the Continent. F. A. Flückiger stated[3] that in 1881, out of 100,000 bales (*surons, colli*) of quinine-containing barks shipped into London, 60,000 bales of 50 kilos weight each consisted of "Cuprea Bark" (*Remijia* species), or a total for that one year alone of 3,307 tons. Of the approximately seven and a half thousand tons of bark shipped from northern South America in 1881, cuprea bark was the chief part.[4]

It appears that after several years the trade in cuprea or *Remijia* bark waned as a result of the depletion of readily available forests. Thus, in the course of a comparatively few years, little heed was paid to this once important botanical raw material until the exigencies of war have again focussed attention on it.[5]

Species of *Remijia* were introduced into India to furnish raw material to the quinine industry (Sikkim plantations, *ca.* 1888).[6]

GEORGE M. HOCKING,
Chief Pharmacognosist

S. B. PENICK AND COMPANY
NEW YORK, N. Y.

[1] W. C. Steere, SCIENCE, n.s., 101: 177–8, 1945.

[2] F. A. Flückiger, *Vorwerks Neues Jahrb. f. Pharmacie u. verwandte Fächer*, 36, 1871.

[3] "The Cinchona Barks," p. 52, 1884.

[4] *Ibid.*, p. 55.

[5] D. Howard and J. Hodgkin, *Pharm. Jour.*, (3) 12: 578–9, 1881; *idem*, *Jour. Chem. Soc.*, 41: 66–8, 1882; Whiffen, *Pharm. Jour.*, (3) 12: 497, 1881; Triana, *Jour. de Pharm. et de Chim.*, (5) 5: 565–75, 1882; Arnaud, *ibid.*, (5) 5: 560–4, 1882; G. Planchon, *Jour. de Pharm. et de Chim.*, (5) 10: 329–336, 419–432, 1884; Watt's Dictionary of the Economic Products of India, II, 289–316. *ca.* 1896.

[6] Watt's Dictionary of the Economic Products of India, II, pp, 314, 5.

CENTENNIAL OF WOOD'S "CLASS-BOOK OF BOTANY"[1]

THE year 1870 was not only the birth year of the Dartmouth Scientific Association but also the twenty-fifth anniversary of an event closely associated with the scientific interests of Dartmouth. The year 1945 is therefore the centennial of that scientific event—the publication of the first edition of Wood's "Class-Book of Botany" at Claremont, N. H. Before the end of its usefulness, this famous text-book and manual had gone into its fiftieth edition and been sold to over a hundred thousand students.

Dartmouth has a double claim for recognition of its contribution to the development of this book—the first botany text to be approved by the American public.

[1] Read at the meeting of the Dartmouth Scientific Association on March 21, 1945.

In the first place, the author was a Dartmouth graduate, and, secondly, he collected the materials for the book in the vicinity of Hanover and with the active assistance of a member of the Dartmouth faculty.

Alphonso Wood was graduated from Dartmouth in 1834, with Phi Beta Kappa rank. He had been born in Chesterfield, N. H., in 1810, educated in the schools and academy there and, like many students of his time, had taught in the rural schools throughout his college course. At Dartmouth there had been no formal training in science, but he had learned something about plants through contacts with lecturers and students in the Medical School, where biology was recognized as an important science.

After graduation he became a teacher of Latin and natural history at Kimball Union Academy, only thirteen miles from Hanover. There he found his greatest interest to be in plants and the teaching of botany to the coeducational student body. Following his marriage in 1842, his wife encouraged this special interest and he gave ever greater attention to the subject with emphasis on field botany and the study of living plants.

In the same year, Dr. Edward E. Phelps, of Windsor, Vt., became lecturer in the Dartmouth Medical School, driving back and forth, sometimes by way of Meriden. This famous doctor and teacher taught the Materia Medica, had done special work in botany and had collected his own herbarium. Just how much he helped the teacher at Meriden, we do not know, but Wood put Dr. Phelps first in the preface acknowledgments of his new "Class Book of Botany."

This book was remarkable for its origin as well as for its immediate success in competition with other texts. It was written because Wood, the obscure teacher, was dissatisfied with all books prepared by professional botanists. The most eminent of these authors was Asa Gray of Harvard, Fisher professor of natural history, although born in the same year as Alphonso Wood, then only thirty-four years old. Gray's "Botanical Text-Book" of over 500 pages and a thousand wood engravings was written by America's greatest botanist, then and still. In 1842 it was in its second edition, designed for "colleges, schools and private students" and published by the powerful house of Wiley and Putnam.

Early in 1844, Wood went to Cambridge and asked Professor Gray to prepare a botany text that could be used to better advantage in the many schools like Kimball Union Academy. Gray replied that there was no need for such a book—that the academy teacher should be able to use the books on the market. After trying again to get along with them in the spring of 1844, Wood approached Dr. Gray a second time and tried to state his objections to current texts in botany. Failing to arouse Gray's interest in writing a new book, Wood determined to prepare his own text.

The new book was printed privately in the following year, a well-bound, full-size, illustrated text of 475 pages but in an edition of only 1,500 copies. It was sold out immediately, and a second edition of 3,000 copies was at once produced through a Boston publishing house. It displaced older books on its merits alone, since the author remained at Meriden, improving the text, correcting errors and adding to the manual part of the book, since the descriptions of native plants formed the core of it and made it unique and attractive to teachers.

For this first edition, three fourths of the species, and later more, were described from specimens, many collected near Meriden, some from the herbarium of one Abel Storrs of Lebanon, N. H., and others from Dr. Phelps's collection at Windsor. Later Wood traveled extensively to learn plants in other states, even as far as the Pacific Coast. On one such trip in August, 1866, he and the Reverend G. H. Atkinson (Dartmouth, 1843), climbed Mt. Hood in Oregon, the first white men to reach its summit. In New England he took a particular interest in its alpine and sub-alpine flora and discovered many of the stations for these rare plants, including the famous area at Lake Willoughby in Vermont.

From the teacher's viewpoint, he sought to have his book appeal to the reason of the student, rather than to his powers of memory. It's still a good idea. The following paragraph from the first edition's preface indicates other ideals:

> That there is need of a new Class-Book of Botany, prepared on the basis of the present advanced state of the science, and, at the same time, adapted to the circumstances of the mass of students collected in our institutions and seminaries of learning, is manifest to all who now attempt either to teach or to learn. The time has arrived when Botany should no longer be presented to the learner encumbered with the puerile misconceptions and barren facts of the old school, but as a System of Nature, raised by recent researches to the dignity and rank of a science founded upon the principles of inductive philosophy. . . . That theory of the floral structure which refers each organ to the principles of the leaf, long since propounded in Germany by the poet Goethe, and recently admitted by authors generally to be coincident with facts, is adopted, of course, in the present work.

For all these and other points of improvement thought to be incorporated in the new book, Wood remained modest about his project. He frequently emphasized that his book was elementary and referred the reader to Gray's books for complete details of topics. On the difficult point of correct scientific names for plants, he adopted those given by Torrey, Gray and others "for very obvious reasons." He always maintained this courteous and respectful attitude toward Gray in spite of their rivalry. He was content to be a good teacher and to make good money from his various books, of which about 800,000 copies were sold.

If there was any one reason for the wide sale and popularity of Wood's "Class-Book of Botany," it was the provisions he made for its use in identifying native plants by quick, easy methods. These were not found in earlier books. For this reason the new book was a great stimulus to field botany and observations of living plants. Wood's great practical contribution to the technique of rapid identification was the scheme he called analytical tables, now known as keys. In his preface, Wood gave Dr. Phelps much credit for the idea, but they were first published and later improved in the "Class-Book." They were both new and useful, just the tools needed by the amateur. The professionals had similar schemes based on natural affinities between families and genera but very difficult for use by others or in the field. They still are and they are still printed in most sections of Gray's "Manual," though many of us would like to see the Woods-Phelps type of artificial keys in the next edition. It's about time after a long one hundred years.

CHARLES J. LYON

DARTMOUTH COLLEGE

SCIENCE AND THE NEW DRAFT REGULATIONS

IN recent articles in SCIENCE (101: 172–173, 1945), and in *The Scientific Monthly* (LX, 37–47, 1945), Dr. M. H. Trytten, director of the Office of Scientific Personnel of the National Research Council, has forcefully pointed out that our present manpower policies have endangered the postwar supply of scientists. The drastic decline in graduate students and in the number of doctoral degrees that have been granted during the war years doubtless will seriously affect the future of American science.

At this moment, an even more serious threat is taking place which will still further curtail the supply of scientific personnel. I refer to the new Selective Service policies promulgated in *Local Board Memorandum No. 115,* as amended on February 21, 1945. Under these new regulations, a considerable number of war research workers and probably the major portion of university staff members who are in the 18 to 30 age group will be reclassified and inducted into military service—most likely for combat duty. According to the above memorandum, it is also expected that the 30 to 38 age group will follow soon thereafter.

Certain agencies, such as the National Roster and OSRD, are authorized to certify research workers for deferment by the local boards. However, the above memorandum states that these agencies ". . . have agreed to specific limitations upon the total number of certifications that will be made . . . and definite limitations upon the type of persons to be certified. . . ." According to reports received by the American Association of Scientific Workers, the universities and colleges, at the insistence of the manpower authorities, have made up lists designating which members of their staffs are first to be released for induction.

Unless these steps are halted, scientific personnel on college staffs and on research projects of less immediate importance to the prosecution of the war will shortly be swept into the armed forces. In terms of manpower, the total number of people involved is small. Induction or deferment of these groups of scientists can do little, therefore, to affect the requirements of the armed forces. In terms of the loss to society and to science, however, the induction of these younger scientists will bring about a grave situation. It will deprive society and science of a group which is probably at the height of its originality and promise. It will furthermore seriously curtail the teaching facilities of the colleges, and thus bring about a still greater deficit in the postwar supply of scientists than even the alarming situation forecast by Dr. Trytten.

There is considerable irony in this new threat to scientific personnel. The contributions science has made to the war effort have impressed the public and our national authorities with the need for fostering and expanding postwar scientific development. This is exemplified in President Roosevelt's letter recently to Dr. Vannevar Bush. Furthermore, the current plans for expanded national and international economies, such as those embodied in the President's program for 60 million jobs, and in the plans of the Dumbarton Oaks, Bretton Woods and Yalta agreements, carry with them a demand for an increased number of scientists, technologists and teachers. At the same time that these important new plans are being developed, young scientists are being drained away and our capacity to provide new ones is being destroyed.

The new Selective Service regulations (*l.c.*, p. 1) that deferments may be made by local draft boards, if it is shown that individuals are "irreplaceable . . . in support of the national health, safety or interest." Scientists will agree that the group of their younger colleagues clearly falls into this category and that all steps should be taken by colleges, universities and other employers of scientists to obtain deferments for this small but important group.

Because we believe that it is clearly in the national