

again discussed and a good formula for poisoning cotton plugs against mite invasion has been added.

In Part II, the Manual Proper, the principle of bringing closely related forms together in "species groups," formerly strongly advocated because of the extreme variability of the species, has been further extended so that now the authors propose fourteen well-marked species groups. Three separate group keys enable even the non-expert to locate his species in the proper group, and this is about all most of us need. The authors accept only about ninety species, varieties and mutations; of these a dozen or so are mutations or varieties of good species.

Few of us have realized how easily one can locate a species by using a dichotomous diagram (Fig. 20): sterigmata present, absent; conidiophores smooth, rough; sclerotia present, absent; Hülle cells or not; conidiophore walls, smooth, rough. Group keys based (1) primarily on color and (2) on morphology cover the same ground.

Having determined to which of the fourteen species groups one's specimen belongs he turns to the special chapter on that group where additional keys subdivide that group into series. For example, the *A. glaucus* group is made up of nine species series. The *A. repens* series of this group consists of three distinct species. If a mycologist has studied his material properly in culture so that he really knows its morphology and culture characters he will have little trouble in identifying his species.

In the Manual Proper one finds morphological features all well figured. It would be difficult to find anywhere in the whole field of mycology more beautifully drawn figures of ascospores found in their figures 27, 34 and 43 where ascospores are figured from various angles. In addition to the inclusion of many half-tone and black and white illustrations, there are eight plates of photographs in color.

An extensive topical bibliography comprises Chapter 22. Literature on acid, enzyme and fat production, pathogenicity, physiology, pigments, soil tests, variation, growth substances, antibiotics, etc., is brought together topically. Reference to pages in the book where a number of these topics are discussed in the text will be found in the comprehensive index.

The "check list of genera and species" (Chapter 24) forms a very valuable part of the book. Sixteen generic names which have been applied to *Aspergillus* and some 600 species and variety names are covered briefly. Here all forms found in the literature are enumerated and their proper allocation is given in a way that serves as a guide to one who wishes to use the literature in the interpretation of names he finds but are "not known to him in nature, in cultures or in exsicciti." The book brings *Aspergillus* up to date.

It is one we must all possess, especially if we are interested in either *Aspergillus* or *Penicillium*.

B. O. DODGE

THE NEW YORK BOTANICAL GARDEN

THE CALENDAR

Consider the Calendar. By BHOLA D. PANTH. New York: Bureau of Publications, Teachers College, Columbia University. 1944. \$1.25.

USUALLY it is the chapter on "Time and the Calendar" in an astronomical text-book through which a college science student gets his first serious introduction to the problem of chronology and the relation of astronomical events to the clock on the mantelpiece and the calendar on the kitchen door. And most attempts to stimulate the interest of the student in calendar development and the need for calendar reform are distinctly inadequate—the subject of the calendar just seems to most students and laymen to be dull. Brief paragraphs, crammed full of cycles and epochs and eras, necessary in such aforementioned astronomy texts, do not improve the situation.

Therefore, supplementary reading is here especially important, and "Consider the Calendar" is just right for the purpose. It is the right length, too, and the student who reads it will not tend to skip important parts, because he knows its conclusion is on the 121st page. After he gets there, he will probably find himself reading Appendix A about holidays, and perhaps figuring out how to determine the day of the week using Appendix B. His interest will be stimulated enough by Mr. Panth's presentation to make him want to go out and spread his command of the calendar among his fellow students.

In Appendix C, Mr. Panth lists numerous books on the calendar. The trouble with most of them is that they are too specific, too lengthy, too boring, too repetitive—Mr. Panth has digested the salient facts of the problem and included in his well-written pages almost every calendar item of interest to the modern mind, scientific or otherwise.

We are told that the book is the outcome of a fellowship established by Teachers College for the study of the calendar from earliest times to our present day, including arguments for the adoption of a revised calendar more adequate for our daily use. His coverage of these points is in four main parts: the calendar in perspective; basic calendar concepts; basic calendar patterns; proposals and trends in calendar improvement.

Early in the book, Mr. Panth appraises the reader of his forthcoming attitude toward the Gregorian calendar: "It is a lingering medieval instrument operating in a highly advanced and synchronized technological society." Throughout, he never misses a chance to point out the inadequacy of the 28 dif-

ferent kinds of months possible in the present system. He brings to this reviewer's mind the full impact of the calendar's lack of respect for the schedules of a monthly publication—the wearing effect on printer, author, editor, publisher, of deadlines by date occurring at all sorts of times in the week, and the deleterious effect of holidays sprinkled here and there in the work routine. Mr. Panth's description of the extra effort spent by our 248,000 schools, colleges and universities in the continental United States as they plan their programs each year is truly impressive; the far-reaching effect these school plans have on a host of other institutions and industries can provoke any reader into realizing that in his case, too, the calendar is helping him to waste some of his life.

The two outstanding plans for calendar reform, 12-month equal quarters and 13-month calendars, are fully discussed, including facts to the effect that by 1938 fourteen governments of the world had approved the World Calendar; six opposed it; and twenty-five were on the fence or otherwise not interested. The United States had "no observations to submit," which is an attitude we hope will change to definite positive action as soon as the United Nations consider social and economic reforms of international significance—the calendar problem can well be placed near the top of the list of important international reforms. On this score, Mr. Panth is optimistic, believing that World War II will help the calendar to follow the example of standard time in becoming internationalized.

Easter comes in for its usual share of the discussion. It seems to the writer that this is not really a problem for the calendar, but for civil and religious authorities—the shifting dates of Easter can be eliminated simply and quickly, or at least confined to whatever date falls on the second Sunday in April, a plan already adopted in England. Mr. Panth errs slightly in repeatedly defining Easter as falling on the Sunday following the first full moon after the vernal equinox. He should refer to the fourteenth day of the moon and to March 21st, and should also mention that the "moon" used is a calendric one having only a vague similarity to the one in the sky in the matter of dates for phase occurrences.

Elsewhere, in describing basic calendar concepts, Mr. Panth says the earth revolves around the sun in a *tropical* year, and on page 32 he says the moon makes one complete circuit of the earth in 29.530588 days, or one *synodic* month. Later he correctly describes the month of the moon's revolution as *sidereal*, 27½ days long, but nowhere does he correctly define the earth's *sidereal* year and point out the difference in its length compared with the tropical year. He might have had an interesting point by noting that a

person celebrating an age of 72 calendar years must really wait one more full day to complete 72 trips around the sun. Also, it is notable that there is no mention of the precessional cycle of 25,800 years.

On page 85, item 4 points out that the two halves of the year are unequal in our present calendar; in common years they are 181 and 184 days long. Previously, item 1 on page 84 criticizes the calendar for not beginning at a solstice or an equinox, a "natural division" for marking time. If such a beginning is desirable and is to be combined with equal halves, calendar makers are doomed partly to disappointment, for the earth's variable revolution gives us quite unequal halves as measured from equinox to equinox; 179 days for fall and winter, and 186 days for spring and summer, in the Northern Hemisphere.

Except for this, however, Mr. Panth's lists of pros and cons on calendar reform are very complete and scholarly and sensible. His numerous charts furnish ample opportunity for one to verify his arguments and make additional comparisons of all kinds of calendars. The histories and operating details of Jewish, Roman, Mohammedan and other calendars are adequately presented, as well as facts concerning the calendars of the French revolutionists, the Soviet republics, and of some of the 185 plans from 33 countries submitted to the League of Nations in 1926. It may be surprising to know that in 1942 over a thousand commercial concerns in the United States and Canada were using internally a 13-period work calendar, consisting mainly of 13 months of four weeks each. It is significant, then, that United States Civil Service this August replaced semi-monthly with bi-weekly payroll periods.

It seems inevitable that our "medieval" calendar will eventually be replaced. "Consider the calendar" is good advice to scientists in general and teachers in particular, for by educating the public to take a scientific attitude toward this problem the chief obstacles, government inertia and religious scruples, will be overcome.

CHARLES A. FEDERER, JR.

HARVARD COLLEGE OBSERVATORY

BOOKS RECEIVED

- COUSINS, NORMAN. *Modern Man Is Obsolete*. Pp. 59. The Viking Press. \$1.00. 1945.
- DE JONG, HERMAN HOLLAND. *Experimental Catatonias: A General Reaction-Form of the Central Nervous System and Its Implications for Human Pathology*. Illustrated. Pp. xiv + 225. The Williams & Wilkins Co. \$4.00. 1945.
- FRIER, W. T. and ALBERT C. HOLLER. *Introduction to Industrial Chemistry*. First edition. Illustrated. Pp. xiv + 368. McGraw-Hill Book Company. \$3.00. 1945.
- HINSIE, LELAND E. *The Person in the Body: An Introduction to Psychosomatic Medicine*. First edition. Pp. 263. W. W. Norton & Company, Inc. \$2.75. 1945.
- MUSSELMAN, M. M. *Wheels in His Head: Father and His Inventions*. Illustrated. Pp. 203. McGraw-Hill Book Company. \$2.50. 1945.