SCIENCE

VOL. 102 FRIDAY, NOVEMBER 2, 1945 No. 2653

SCIENCE: A Weekly Journal, since 1900 the official organ of the American Association for the Advancement of Science. Published by the American Association for the Advancement of Science every Friday at Lancaster, Pennsylvania.

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Communications relative to membership in the Association and to all matters of business of the Association should be addressed to the Permanent Secretary, A.A.A.S., Smithsonian Institution Building, Washington 25, D. C.

Annual subscription, $6.00 Single copies, 15 cents

THE ATOM AND HUMANITY[1]

By Professor **HAROLD C. UREY**

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ALFRED NOBEL, whose birthday we celebrate to-day, was the inventor of dynamite and of smokeless propellant powders. At the same time that he engaged in this scientific research he was very much interested in bringing lasting peace to the world. In a conversation with his friends he remarked that his explosives would bring peace more quickly than peace societies. After some fifty years we now realize that Nobel was wrong in his conclusion, and we find that the peace societies were also unsuccessful.

To-day we are faced with far more powerful explosives than any that Nobel dreamed of, and we are still discussing wars and means of bringing peace to this planet. It is my purpose to discuss the relationship of this newest weapon, the atomic bomb, to the problem of world peace. May I say that this discussion has no relationship to any atomic bomb legislation or any diplomatic moves of the United States Government. It is intended to bring the urgency of the problem before you and to discuss some long-time views relative to enduring peace.

First of all I wish to show that the progress of every weapon that has been invented by man proceeds through the stages of crude invention to successful improvements, and the development of counter measures against it. The position of weapons of this kind as we know them to-day, is that they are in use by major combatants; that they produce a great deal of destruction in modern war, and that no completely decisive defense against them has ever been secured.

[1] Address delivered at the luncheon commemorating the birthday of Alfred Nobel, on October 21, 1945.

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,* 27⅓ 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.

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BOOKS RECEIVED

COUSINS, NORMAN. *Modern Man Is Obsolete.* Pp. 59. The Viking Press. $1.00. 1945.

DE JONG, HERMAN HOLLAND. *Experimental Catatonia: 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.