During the whole day the average percentage appears to have been 15 per cent. higher at Benkoelen than at Palembang.

These are readings from the records of Jordan's sunshine recorder with sensitive paper, furnished by Negretti & Zambra, London. Of course the probability of a clear sky, as needed for the observation of the eclipse, is smaller than is suggested by the above-mentioned figures, as the sensitive paper yields a record also when there are thin clouds. The data therefore have chiefly a relative value with a view to a comparison between the two places in question.

(Signed) C. BRAAK,
Director
C. G. ABBOT,
SMITHSONIAN INSTITUTION *Assistant Secretary*

CALENDAR REFORM

I SHOULD like to suggest an amendment to Mr. A. L. Candy's revised calendar. I would have in the new calendar the months of January, April, July and October begin with Sunday, in place of Monday.

It is desirable to have the same number of working days in each calendar month. In order to do this it is necessary to start the 31 day months on a Friday, Saturday or Sunday, so that the 31 day months may include five Sundays each, and give 26 week days for every month in the year.

While it would be possible to begin the first day of each quarter with any one of the three days mentioned, it would seem to me desirable to begin them with either Saturday or Sunday, preferably Sunday. By doing so we should have the sequence of Saturday, December 30, New Year's Day, and Sunday, January 1, which would naturally form a three day holiday for almost everyone. In the case of leap years, there would be a similar three day stretch, formed by Saturday, June 30, mid-summer holiday, and Sunday, July 1, This would be a welcome respite for many people who find it hard to get three days together.

In general it is desirable to have holidays come upon Saturday, Sunday or Monday, so they do not break up the working week, and afford the maximum relaxation with minimum interference with business. Where the first day of each quarter begins on Monday, as suggested by A. L. C., only Lincoln's Birthday and Armistice Day come at the week-end, both falling on Monday. But if we start the quarter with Sunday, then we have the above holidays coming on Sunday, which is just as good as Monday because they will be celebrated on Monday, and in addition we have December 25 falling upon Monday instead of Tuesday, which is a manifest addition.

ALVAN L. DAVIS

THE GILBOA FOSSIL FOREST

DR. JOHN M. CLARKE, of the New York State Museum, in an article on "The oldest of the forests" (*The Scientific Monthly*, January, 1921) has vividly described the fossil Devonian Forest (Psarronius) found near Gilboa, New York.

The operations of the Board of Water Supply of the City of New York have uncovered a number of these fossil stumps, and it has occurred to the writer that some, at least, of the museums in the country which have not already secured specimens would like to add to their collections. The work at Gilboa is drawing to a close, and the opportunity of securing specimens will never again be as good as during the present summer season. The number of stumps available is of course, limited. Inquiries may be addressed to the undersigned.

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SCIENTIFIC BOOKS

The Life of Sir William Osler. By HARVEY CUSHING. 2 vols. 1442 pp. 8°. Oxford University Press, New York. Price $12.50.

HARVEY CUSHING, one of the most virile and straightforward of living American writers, has very rightly conceived his Osler biography as *mémoires pour servir*. Leaving ultimate appraisal of this great physician's merits to posterity, he has, with secure good taste, taken eulogy (an obituary and lapidary function) for granted, and wisely shunned "the foolish face of praise." Here, indeed, the man Osler speaks for himself, through his clinical achievement, his letters and writings, his thousandfold acts of charity and good-will, his humorous pranks, his unique sense of honor. Hence, where necessary, Cushing has not hesitated to cope with those errors in judgment which Osler himself defined as "mistakes of the head, but never of the heart." The material to be handled was enormous, not so much in the way of letters, for Osler was a poor and telegraphic, if multifarious letter writer, but in the adjustment of the countless minor details of his very busy life to its actual course and tenor. Here all is ordered, documented, controlled as to fact, place and date by accurate footnote references, well indexed, with analytical table of contents and a rubric at the top of each page telling its actual content. In consequence, it is very easy to find one's way about in these volumes. The narrative moves steadily and surely forward, from point to point and period to period. Each sentence states a fact, and we can follow Osler's career understandingly, from the boyhood days in unsettled upper Canada, through the prankish student period

and the subsequent laboratory ardors of the young Montreal professor, to Oxford and the end. Through its commendable absence of eulogy, fine writing and apologetic slaver, the book is thus one of the best of medical biographies, quite up to the standard of Roth's Vesalius in respect of continuity *viâ* documentation.

We gather that Osler was a lively, natural, healthy boy, who set off his Church of England training by the proverbial skylarking of a clergyman's son, even as most of us have been chased by constables and car-conductors, or otherwise hauled up for playing "hookey" *en masse* or smoking out our natural enemies with chemical fumes. Led into biology by the parish priest W. A. Johnson and the unworldly James Bovell, it was natural that the young Osler should turn from university studies and the thought of holy orders to medicine. The ultimate result of these earlier dallyings with microscopy was the description of the thrombocytes and the discovery of *Filaria osleri*. Under the guidance of Dr. Palmer Howard, whose strong face resembles that of Froude, Osler soon became a steady, serious student, consecrated to medicine, and thereafter, his life is one of unparalleled devotion to patients and pupils, diversified by literary labors, some public service, a number of humorous experiences, and such outstanding events as his marriage, the successive calls to Philadelphia, Baltimore and Oxford, and the death of his only son in the war. As a boy, he received instruction in music, drawing and dancing, but in the sabbatical atmosphere of Bond Head and Dundas, these were "parlor accomplishments"; we hear as little of concerts, theater-going, picture galleries and ballrooms in Osler's life as in Jacobi's. His relaxations were the classics, English literature and the history of medicine, in which his scholarship, brought to a fine focus in his address of 1918, was unimpeachable. Although badgered not a little in youth as to the exact shade of his orthodoxy, an inquisition as deadly as disputing degrees of gentility, he weathered it all with the serenity of Peter Pan facing Wendy's poser as to the nature of his matrimonial intentions. In practical joking, Osler was a kind of Peter Pan. His famous farewell address of 1905, on the advantages of chloroforming people at sixty, was immediately characterized by Billings, in my hearing, as "one of Osler's jokes." Just before his departure for Oxford, I heard Osler say that to receive many LL.D's was equivalent to being laid on the shelf. What he called his "splintery and illogical mind" was, in fact, the Celt-Iberian in him, his defensive reaction against boredom. This mental dualism is particularly prominent in the dispute ever going on in his mind as to the futility of set examinations for medical students. He favored the military method of estimating a man day by day, for "corrective action," with "finals" as a mere confirmatory test. Due to his unfortunate training under Bastian, the coryphaeus of "spontaneous generation," Osler was slow to think bacteriologically, and did not sense the value of Pasteur's and Laveran's discoveries as swiftly as Sternberg or Councilman; but once convinced (*e.g.*, after making 70 separate blood-tests), he stacked up nobly.

An impression seems to prevail among some younger men, that Osler's career was a mere effect of personality, as with such clinical actors as Dieulafoy. This is silly. Osler described the main features of four relatively unknown diseases and added vastly to the clinical minutiæ which are finally absorbed in text-books. In many meetings and conversations, I never once heard him refer to these things, otherwise buried by the poor indexing of his book on Practice. I know of great professors who have selfishly assimilated their pupils' ideas and inventions without a word of credit. That was not Carl Ludwig's way, nor was it Osler's. I personally know that when a book of mine was announced for publication, Osler deliberately held up his Lowell lectures on the same subject (then in type) and they were not published until after his death. That was his generous, self-effacing way with younger men. We shall not fail to keep his memory green and his spotless reputation from assoil.

A fair slant on Osler's character is afforded by his innate aversion to "Jedburgh justice" even toward the enemies of his country. There was in him much of the *"tout comprendre, c'est tout pardonner"* of the priest, the tendency "to ignore, to disdain, to consider, to overlook" which William James regarded as "the essence of the gentleman." When Edward Dowden's mawkish life of Shelley appeared, a great clatter about the unfortunate poet's failings was stirred up by Matthew Arnold's moralizing critique and the dreadful effusions of those arch-Philistines, Charles Dudley Warner and the later Mark Twain. When some one brought up the subject casually in the Surgeon General's Library, Osler said curtly and sadly, "Shelley has been well hanged!" and left the building abruptly without saying adieu. I feel sure that his sentiments were those of Swinburne: *"Otez à Shelley sa foi sublime, son dévouement héroïque, son amour du droit et de l'idéal, il sera toujours un des plus grands poètes de tous les siècles."* During the war, Osler's attitude was that of a first-class military man—the impersonal "hostile view" rather than the hysterical "hostile feeling" of the hymns of hate. In 1915, he wrote to Wenckebach in Vienna: "How interesting for you to be a follower

of your great countrymen, van Swieten and de Haën!" The end of the war found him tolerant and helpful toward starving enemy colleagues, and no proof of gratitude more touching than the laurel wreaths which Sudhoff, Wenckebach and Friedrich Müller laid upon his grave.

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SPECIAL ARTICLES

ON THE X-RAY DIFFRACTION EFFECTS FROM SOLID FATTY ACIDS

X-RAY diffraction effects have been obtained from solid films of numerous fatty acids and other long-chain carbon compounds.[1] These films have been made by allowing the molten substance to solidify on a glass or mica plate. The reflection photographs from such a preparation are not powder patterns, but they have as their conspicuous feature a series of several orders of an exceptionally large spacing.

It has sometimes been imagined that certain solids possess a regularity of molecular arrangement in only one or two dimensions. Such "smectic" substances[2] would thus be intermediate between crystals on the one extreme and amorphous solids on the other. The single reflections (and their higher orders) observed from various fatty acids and other long carbon-chain compounds have been cited[3] to show that they are such "smectic" substances. This conclusion has been doubted, however, by others.[4] From a different point of view, also, X-ray diffraction from the long carbon-chain solids is of interest. In the past the relatively short interplanar distances in such crystal gratings as calcite or gypsum have set a definite limit beyond which the X-ray spectrographs could not go in studying radiation. The much greater spacings (up to about 60A) found from these organic compounds, however, open up a correspondingly long wave-length range to direct investigation.

Several fatty acids have consequently been studied with the two fold purpose (1) of throwing light upon their possibly "smectic" nature and (2) of finding means of preparing them in the form best suited to their use as X-ray gratings. Most of the work happens, however, to have been carried out upon palmitic acid and, unless otherwise stated, these results refer to this particular long-chain compound.

It has recently been stated[5] that stearic acid is truly crystalline. The following experiments seem to show definitely that palmitic acid also is crystalline at ordinary temperatures. If a small amount of the pure acid is melted between two glass plates and cooled in such a way that solidification proceeds from a single point outwards, large areas of the resultant film prove on microscopic examination to have a common optical orientation. Fairly good interference figures are produced by these patches. An X-ray reflection photograph from such an acid film shows very strongly the characteristic several orders of large spacing, together with a few somewhat hazy lines from the more usual short spacings. If, on the other hand, crystallization is allowed to start at many points during the preparation of the solid film, the areas of optical homogeneity are greatly diminished in size. Such a film may be prepared by rapid cooling and is most readily obtained if the acid is not quite pure. In extreme cases the X-ray reflection photograph from such a film will show little or no evidence of the long spacing reflections. In their place appear several hazier lines of the sort typical of a powder photograph. This powder character is confirmed by the fact that the resulting photograph is substantially the same when the acid film is rotated as when it is held stationary in two arbitrarily placed positions. Similar photographs showing predominant powder reflections have also been made from impure erucic and, less easily, from fairly pure lauric acid.

Palmitic acid, in common with numerous other compounds of this class, can be obtained in flakes from various organic solvents. By cooling an acetone solution in a sealed tube, we have obtained single, very thin plates a centimeter across. These plates give good interference figures. Such flakes from acetone and from α-monochloronaphthalene are diamond-shaped with the interior acute angle 56°. They are biaxial with $+2V$ small, and with the optic axial plane apparently normal to the plane of the flakes and bisecting the acute angle. The acute bisectrix is inclined about 40° to the plane of the flakes. The refractive indices are: $\alpha = 1.495$, $\beta = 1.507$, $\gamma = 1.58$. Reflection spectrum photographs from one of these plates show the several orders of the large spacing with extraordinary intensity. Apparently on account

[1] M. de Broglie and E. Friedel, Compt. rend. *176*, 738 (1923); A. Müller, *Trans. Chem. Soc.* (London) *123*, 2043 (1923); G. Shearer, *ibid.*, *123*, 3152 (1923); A. Müller and G. Shearer, *ibid.*, *123*, 3156 (1923); S. H. Piper and E. N. Grindley, *Proc. Phys. Soc.* *35*, 269 (1923); R. E. Gibbs, *J. Chem. Soc.* (London) *125*, 2622 (1924).

[2] G. Friedel, *Ann. de Phys.* *23*, 273 (1922).

[3] M. de Broglie and E. Friedel, *op. cit.*; E. Friedel, Compt. rend., *180*, 269 (1925).

[4] J. W. MacBain, *Nature*, *113*, 554 (1924); *114*, 49 (1924).

[5] R. E. Gibbs, *op. cit.*