College, Suffolk Street, Birmingham (May 4). A workshop instructor in carpentry and joinery at the Birmingham Central Technical College—The Principal, The Central Technical College, Suffolk Street, Birmingham (May 6). A technical officer for the Air Ministry Technical Development Staff, primarily for work at the Royal Air Force Base, Gosport, in connexion with the development of torpedoes for aircraft use—The Secretary, Air Ministry (S.2) (quoting B.335) (May 11). A research assistant in the department of coal gas and fuel industries of the University of Leeds, for work in connexion with the Joint Research Committee of the Institution of Gas Engineers and the University—The Registrar, The University, Leeds (May 12). A post in the zoological department of the University of Manchester—The Registrar, The University, Manchester (May 14). A professor of physiology in the University of Bristol—The Secretary, The University, Bristol (May 16). An assistant lecturer in physiology in the physiological department of the University of Birmingham—The Secretary, The University, Birmingham (May 31). Probationers for the Indian Forest Service—The Secretary, Services and General Department, India Office, S.W.1 (July 1). An assistant in the mechanical engineering section of the Engineering Department of the Halifax Municipal Technical College—The Principal, Municipal Technical College, Halifax. A medical woman with experience in teaching anatomy, to act for the professor at the Lady Hardinge Medical College, New Delhi—The College Principal, Lady Hardinge Medical College, New Delhi, India. A laboratory steward in the physics department of the Military College of Science, Woolwich. A qualified technical chemist at the Stores Inspection Department of the Office of the Crown Agents for the Colonies—The Crown Agents for the Colonies, 4 Millbank, S.W. (quoting O/Sec. Office 91).

Our Astronomical Column.

THE RADIUS OF SPACE—The following cablegram (which has been somewhat expanded from its very concise telegraphic wording) was received from Dr. Ludwik Silberstein on April 10: "A star formula which is developed in the course of my monograph 'The Size of the Universe,' now in course of publication at the Oxford University Press, when applied to 35 stars of type O yields for the radius of space the value $3{\cdot}2 \times 10^{11}$ astronomical units; when applied to 29 Cepheids, $3{\cdot}0 \times 10^{11}$, and when applied to the 246 more distant stars of Young and Harper's list, $3{\cdot}4 \times 10^{11}$ units. The latter computation was completed on April 7; its agreement with the two former ones definitely establishes that space is finite, and that its radius is thirty trillion miles (in the British use of the term), or about five million light-years."

The Einstein theory has familiarised us with the idea of space being limited and re-entrant into itself; the surprising point in the above communication is the much smaller value that is assigned to the radius than has been found by other methods. It is, indeed, only a small fraction of the estimates of the distances of the fainter spiral nebulæ that have been assigned in recent years by Profs. Hubble and Shapley; these go up to 140 million light-years. The acceptance of Dr. Silberstein's value would mean a drastic revision of the whole method of determining distances by the periods and apparent magnitudes of Cepheid variables; assuming its truth for the moment, we note that the two spirals, the distance of which Hubble found to be about a million light-years (the Andromeda nebula and Messier 33), should also be visible in the opposite direction, since their distance by that route would be only nine times as great as by the shorter route; it so happens that there are conspicuous nebulæ very near the opposite points—h 3433 and Messier 83 respectively; their positions for 1860 are respectively R.A. $12^h\ 44^m\ 37^s$, S. Decl. 40° 18·7′, and $13^h\ 29^m\ 9^s$, S. 29° 9·0′. The appearance of Dr. Silberstein's monograph will be awaited with interest, but in the meantime his announcement will necessarily be received with some reserve.

THE SPECTROHELIOSCOPE.—Prof. G. E. Hale, the inventor of the spectrohelioscope, contributes an article upon it to the *Scientific American* for April; he shows that it is not a mere toy, designed to enable the eye to discern features that could be equally well studied by photography; in fact, in several respects it gives the observer powers of study much greater than those afforded by the photographic plate. This only records the aspect at a single instant, whereas the observer with the spectrohelioscope can quickly detect the most active regions of the disc, and follow the changes continuously. Prof. Hale says: "I have frequently seen the swift flow towards sunspots of masses of hydrogen larger than the earth, adequately recorded with the spectroheliograph only once in twenty years."

Prof. Hale goes on to describe a further improvement, the 'line shifter'; this is an adjustable plate of plane glass behind the second slit, which permits the observer to set different parts of the width of the line on the slit in quick succession; this gives information about the radial motions in different regions of the formation. One side of an arch may be seen to be rising, while the other is falling. Prof. Hale has prepared instructions whereby a handy person can construct a spectrohelioscope at a cost "comparable with that of a fine radio set."

GREENWICH OBSERVATIONS OF THE SUN AND PLANETS.—The Astronomer Royal and Mr. R. T. Cullen contribute a paper on this subject to the January number of the *Monthly Notices* of the Royal Astronomical Society. The study of the solar observations is carried back to those of Bradley, beginning about 1750. It was found that early observations of the sun in right ascension were subject to large errors; those in declination appeared to be more satisfactory. Accordingly, the error in longitude has now been deduced from the observations of declination made near each equinox; this is a similar process to the well-known method of Flamsteed for determining the equinox. The 'secular acceleration' of the sun is clearly shown by the residuals. The coefficient of T^2 is deduced as $+0{\cdot}78''$, which is comparable with that found by Dr. Fotheringham. The solar residuals show oscillations which accord fairly well in period and phase with those of the moon, but are about one-tenth of the amplitude.

As regards the outer planets, the residuals of Saturn changed abruptly from + to − at the date of the introduction of the moving wire, 1915. Those of Neptune have been changing fairly uniformly from zero early in the century to $-3''$ in 1928. Its latitude also shows progressive change, but not quite so regular.