G. Schiaparelli, and the result is a work of which the present is the first volume. It contains fifty-four of Brioschi's papers, of which forty were originally published during the period 1851–1857 in the *Annali di Scienze matematiche e fisiche* under the editorship of Barnaba Tortolini, and the remainder appeared in the *Annali di matematica pura ed applicata*, which formed a continuation of the previous journal, during the years 1858–1861. The last of the series is Brioschi's classical monograph on the theory of covariants and invariants of binary forms and their principal applications. The arrangement adopted has thus been to classify Brioschi's papers according to the journals in which they are published and not according to date or subject-matter.

The committee placed the principal work of editing the volumes in the hands of Profs. Beltrami and Cremona, and on the death of the former the task was continued by Prof. Valentino Cerruti, the papers in the present volume being revised in addition by Profs. Pascal, Gerbaldi, Loria, Pittarelli, Reina and Tonelli. To these names must be added those of Profs. Bianchi and Capelli in connection with the revision of material for succeeding volumes.

A photogravure portrait of Brioschi forms a frontispiece, and a short history of his life will appear at the end of the complete work, forming a lasting monument to the great Italian mathematician.

Webster's International Dictionary of the English Language. To which is now added a Supplement of 25,000 Words and Phrases. Edited by W. T. Harris, Ph.D., LL.D., Editor-in-Chief. (London : George Bell and Sons.) Price 2 guineas net.

No more convincing proof of the extent to which the English language has been enriched as a result of the wonderful activity in scientific circles during recent years could be found than this new edition of the world-renowned "Webster." The supplement, which distinguishes this from the last edition of the dictionary, is largely composed of scientific terms and technical expressions which have come into existence during the last decade. It is only necessary to glance down a list of the names of the men of science who have assisted Dr. Harris in the preparation of this substantial addendum to satisfy oneself that the definitions will prove clear, accurate and complete. Repeated tests have shown that such anticipations are well founded, a conclusion that will not seem surprising when it is stated that among the assistants on whose services the Editor-in-Chief has been able to rely are such scientific experts as Prof. E. S. Dana, Prof. G. K. Gilbert, Dr. E. S. Holden, Dr. T. C. Mendenhall, Prof. E. L. Nichols, Prof. I. Remsen, Prof. A. E. Verrill, Prof. L. F. Ward, and many others of equal authority. The dictionary will continue to merit the confidence with which it has long been regarded.

Education and Empire. Addresses on certain Topics of the Day. By Richard Burdon Haldane, M.P., LL.D., K.C. Pp. xvi + 195. (London : John Murray). Price 5s. net.

In the first two addresses in this volume Mr. Haldane is concerned entirely with educational problems, and in both of them pleads in a convincing manner for more earnest attention to the great need of increased facilities for higher technical instruction and for scientific research in this country. The comparisons which are here instituted between what is done in the United Kingdom and in Germany and the United States of North America in the matter of providing technical colleges and laboratories for scientific research should, if anything will, explain to our manufacturers and merchants the reason for the phenomenal success of our trade rivals.

LETTERS TO THE EDITOR.

[The Editor does not hold himself responsible for opinions expressed by his correspondents. Neither can he undertake to return, or to correspond with the writers of, rejected manuscripts intended for this or any other part of NATURE. *No notice is taken of anonymous communications.]*

Mr. Marconi's Results in Day and Night Wireless Telegraphy.

I CAN assure Prof. Joly that his explanation (p. 199) will not do.

The observed effect, which if confirmed is very interesting, seems to me to be due to the conductivity, and consequent partial opacity, of air, under the influence of ultra-violet solar radiation.

No doubt electrons must be given off from matter (dust as well as other matter) in the solar beams ; and the presence of these will convert the atmosphere into a feeble conductor. Conducting power in the sea-water surface assists and guides the waves, retaining them in two dimensions after the same fashion as a telegraph wire retains them in one ; but conductivity in the dielectric itself will tend to dissipate and enfeeble the waves, by a process of reflection resulting in some amount of distortion.   OLIVER LODGE.

June 27.

Kinetic Theory of Planetary Atmospheres.

In the *Astrophysical Journal* for November, 1901, is printed a paper of mine in the first part of which a method is proposed for determining the mean temperatures of the atmospheres of the planets and those of their surfaces. In the second part of the paper an attempt was made with the use of these temperatures to determine the composition of the atmospheres of the planets by the "empiric" method proposed by Dr. Johnstone Stoney and based on the supposition that helium escapes from the earth's atmosphere. The most probable velocity of the molecules of helium is 1093 metres per second at 15° C. (the mean temperature of the earth's surface), and the velocity sufficient to overcome the earth's attraction is 11,170 metres per second. Hence it has been inferred that a gas escapes from the surface of the planet, if the most probable velocity of its molecules is 10·22 times less than that required to overcome the planet's attraction.

Prof. G. H. Bryan (NATURE, No. 1698, p. 54) has remarked that according to his and Mr. Cook's calculations, founded on the kinetic theory of gases, helium cannot escape to any sensible extent from the earth's atmosphere by the motion of its molecules among themselves. But the assumption that helium cannot be retained by the earth's attraction is arbitrary. It is possible that helium exists in our atmosphere in only a very small quantity, because it is contained in the interplanetary medium in very insignificant proportions ; its escaping, if it occurs, is effected, perhaps, by ordinary diffusion. We know several substances, as thorium, osmium, &c., which are very rare minerals, though their atomic weight is great. It is possible, moreover, that even hydrogen can be retained by the earth ; it seems to be confirmed by the observations of M. Gautier (*Bulletin* de la Soc. chim. de Paris, December 5, 1900, p. 884) and Lord Rayleigh (*Phil. Mag.*, vol. iii., pp. 416–422, 1902), who have found free hydrogen in atmospheric air.

Assuming the last supposition, we must substitute for the number 10·22 some other less than 7·42 ($= \frac{11170}{1505}$, where 1505 is the most probable molecular velocity of hydrogen at 15° C.), for instance, 7, 6, or 5, in order that an appreciable number of molecules may attain the speed sufficient to carry them to infinity ; and consequently table iii. in my paper must be changed correspondingly.   E. ROGOVSKY.

The Coloured Sunsets.

THE recent fine weather has enabled one to observe the sunsets and after-glows under very favourable circumstances, and the most striking feature observed was the predominance of the beautiful salmon-colour tinge, which became most intense when the after-glow was brightest.

Practically none of the sunsets observed were strikingly red,