which, soon or late, must cease; for, while many buy, few read, and they the close readers who make quick work of the loose author. If it is a necessary stage of our evolution, it may be hoped that the relay is not far removed.

GOVERNMENT SURVEYS.

THE proper co-ordination and management of the different government surveys, in order to secure in the most economical manner the results for which they were created, has been and yet is the subject of considerable discussion, and of diverse views among those interested. The consolidation of the geological surveys has prevented much of the clashing that formerly inevitably resulted, and at different times the national academy has been called upon to propose plans for the relations that should exist between the different bureaus. The chief ones proposed, as the readers of *Science* are aware, are, 1°, that the secretary of the Smithsonian institution should be placed in control: 2°, that there should be a cabinet officer, a secretary of science and industry, who should be charged with all the different bureaus. Prof. W. P. Trowbridge, in the issue of the New York *Star* for April 13, urges the establishment of a permanent commission, which should be competent to understand the different works, and have sufficient time to examine them yearly in detail. As he further says, there can be no question but that, in the appropriation of money by congress for any purpose whatsoever, the objects and aims to be accomplished by such appropriation should be definitely and fully known; and funds for any public works of a continuous character should never be dependent upon personal urging by the heads of bureaus, and all this should be within the province of a central co-ordinating authority.

He believes that a properly organized permanent non-political commission, such as that known as the Regents of the Smithsonian institution or the Lighthouse board, and in which should be represented the executive heads of the bureaus, the legislative branch of the government, and the scientific men of the country, would be an efficient safeguard against misdirected expenditures, faulty schemes or projects, and the duplication of work by two or more bureaus. It is not at all certain that a cabinet officer, with his political tenure of office, would be sufficient to co-ordinate the different surveys, except in so far as he would serve as a fiscal administrator, and as a medium between the scientific bureaus and congress or the executive. Political considerations would make it improbable that such a head could always be found who should possess the varied scientific and other qualifications that would be required to determine the scope, the field of work and investigation, and the methods to be pursued for each branch of scientific work.

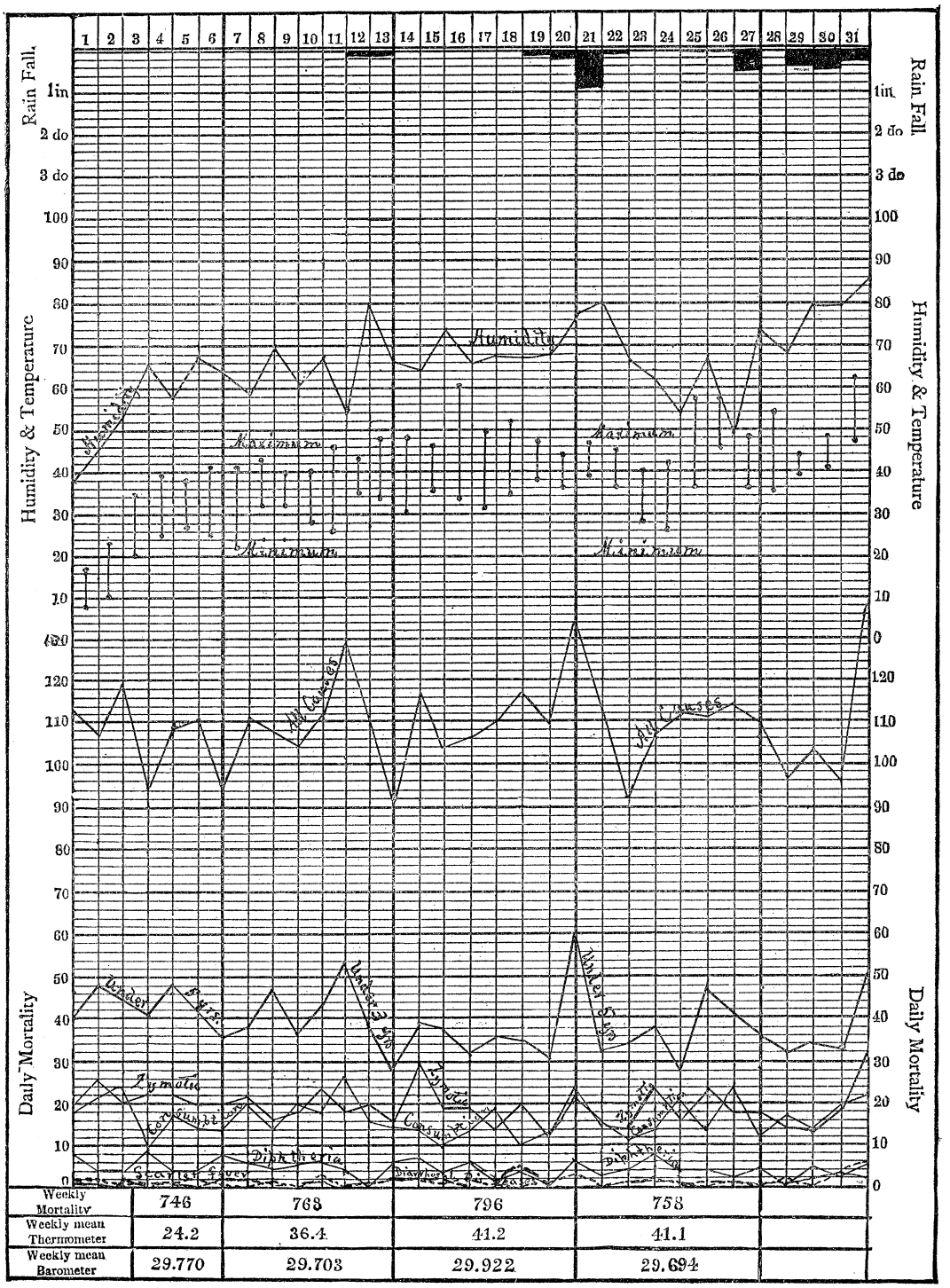
The executive and scientific details, as he rightly says, of any one of these bureaus, are enough to tax to the full extent of his powers the most skilled expert in those branches of scientific and practical knowledge which belong to the objects represented by the bureau. For this reason he deprecates any attempt to consolidate the different bureaus, and especially the coast and geodetic survey, whose work has been so fruitful of practical and valuable results for so many years, with any other.

The unfortunate shortcomings in this survey during the past year have given currency to numerous false and exaggerated rumors, which have tended to produce an injurious result, not only upon the public mind, but upon congress. Professor Trowbridge urges the injustice of including in general condemnation all the different bureaus on account of the errors of individuals in one branch, and yet more justly cites the long years of faithful and highly valuable public services that have been rendered by the great body of officers and attachés of the coast survey, who have grown up in the service, and who have not for a moment been included in any recent accusations.

HEALTH OF NEW YORK DURING MARCH.

WE continue in the present number the graphic representation of the daily mortality in New York, which was commenced in *Science* in the number for March 19. In February the greatest mortality from all causes of disease was during the tenth day, when 118 persons died: during March this was exceeded on four days, running up to 137 on the last day of the month. During the twenty-eight days of February there were 2,767 deaths; during the same period in March there were 3,054 deaths, — an increase of 277: if to this are added the deaths which occurred in the last three days of March, we shall have 3,392 representing the mortality of the past month, — an average of nearly 110 each day, or about 5 persons every hour.

The number of deaths of children under five years of age has increased as compared with February; there has also been an increase in the zymotic class and in consumption; while the mortality from diphtheria and scarlet-fever is less. Diarrhoeal diseases have carried off 32 persons, as compared with 33 in the preceding month.


Rain Fall.
Humidity & Temperature
Daily Mortality
Humidity
Maximum
Minimum
Under 5 yrs.
Bronchitis
Consumption
Diarrhœa
Weekly Mortality 746 768 796 758
Weekly mean Thermometer 24.2 36.4 41.2 41.1
Weekly mean Barometer 29.770 29.703 29.922 29.694

The coincidence between the lines of scarlet-fever and diarrhoeal diseases, to which attention was directed in the number of *Science* already referred to, is equally marked this month: in fact, they run so nearly parallel, that it is often impossible to distinguish them. The summer mortality has not yet commenced to show itself, but many weeks will not pass before we shall see its line gradually rising higher and higher, until it reaches its height in midsummer.

The meteorology for the month presents some interesting features. The rainfall was considerably less than in February; in the latter month 4.89 inches having fallen, while during March there were 2.83 inches, the actual time in which this amount fell being 2 days 20 hours 40 minutes. During the sixteen years 1869–84 this amount was exceeded in every year but four, so that March, 1886, was, in comparison with other years, a dry month.

Another point of interest in the meteorology of March of this year is the absence of snow. But an inch fell during the entire month, and that on the twenty-seventh day. During the period of sixteen years already referred to, so small an amount fell in only five years, while in some of the years the quantity was very great; notably in 1870, when 9.63 inches fell; in 1875, 15.25 inches; and in 1883, 10 inches.

It will be remembered that in February the highest reading of the thermometer was 52° F., and the lowest — 4° F. In March the maximum temperature was 62° F., and the minimum 8° F., the monthly mean for March being some 31° higher than that for the preceding month.

The population of the city of New York on March 1 was estimated to be 1,424,903, and increases presumably 799 each week.

POPULAR ASTRONOMY.

IN the 'Story of the heavens,' Dr. Ball presents to the popular reader an extremely entertaining account of the discoveries, researches, facts, and theories, of a science which, in a general way, is of interest to a larger class of people than any other department of learning. The book is specially directed to the non-astronomical; the style is strong and vigorous; and many points are elucidated in so striking a manner that even the professional astronomer, if modest enough, can get many a good suggestion from it.

Ambiguities and misstatements of fact are quite entirely absent. Dr. Ball appears to be rather less certain than the facts warrant, that the sun-spots are depressions; and he would find few astronomers, in this country at least, who would agree with him that the late Professor Watson probably discovered an intra-mercurial planet or planets during the eclipse of 1878. In parts of his work the historical method is pushed to the extreme. The complex theories of our astronomy will doubtless appear in the least difficult form if viewed in the light of the logical order of their dawning upon the philosophic mind; but the attempt to insist on this method of treatment appears, in some instances, to have led Dr. Ball into an unnecessary multiplication of wordy paragraphs. While thoroughly interesting and delightfully told, his 'Story' is, for all that, a pretty long one; and we cannot but think that it would have been better received, not to say more carefully read, if, by some such omissions as these, Dr. Ball had sooner brought it to a close.

Works on popular science, often a mere retailing at second or third hand of the labors of the professional investigator, are not infrequently filled with such misrepresentations of these labors as to be utterly misleading to the learner, not to say wrath-inspiring to those scientists whose work forms the unwilling subject of the story. Dr. Ball commits no offence of this sort: he is one of these investigators himself, but his own researches are not brought into undue prominence. We should, however, take exception to his account of the transit of Venus of 1882 as seen at Dunsink, where no observations of marked importance could be made, — an account which, therefore, cannot give a sufficient and characteristic view of the magnitude of the very extended operations conducted elsewhere on that occasion. We find no allusion to the abundant series of photographs of that transit, obtained by the American parties, which, it is safe to say, constitute the most important and successful record of a transit of Venus ever secured.

In some other parts, also, the 'Story of the heavens' is not well balanced. There is, perchance, the best of reason for being dissatisfied, or rather unsatisfied, with the present state of solar research. In the chapter on the sun, we find an exceptionally full description of the solar spots; but the question as to what they are is dismissed in a word. The progressive theories of the constitution of these objects form a most important contribution to the history of astronomy; and many a page in the book might better have been devoted to an outlined statement of these theories, and of what the spots, to say the least, seem likely to be. We should make much the same criticism of the author's treatment of that

The story of the heavens. By ROBERT STAWELL BALL. London, *Cassell*, 1885. 8°.