The third, Dr. Henry Hastings Hunt, has within a month ceased from his labors, and been borne to his honored grave; but I feel justified in giving his testimony emphatically in its favor.

My plan, slightly detailed, is as follows: Beginning with some explanations of a general character, and the definition of certain terms which are so technical that the novice cannot be expected to know them, I give the names, both English and Latin, and the limits of extension of all of the superficial parts; for I have learned that it is not safe to count on anybody's knowing what an anatomist or surgeon means by various terms applied to parts which are visible without dissection, and have vernacular appellations. Histology is then presented in an elementary way, and the student is taught the essential truths about the simple tissues. The different kinds of membranes are discussed, and the structure of glands in general is naturally given the next place. The student is now fairly equipped for the study of the viscera, and these are taken up in whatever order the physiologist of the institution prefers. In one important particular my course at this period differs from visceral anatomy as presented in most of our books; the brain and spinal cord, the noblest and most interesting of all entrails, are included in the company of the viscera, and not, as ordinarily in the text-books, with the nerves. After this come in regular, conventional style the bones, ligaments, muscles, arteries, veins, lymphatics and nerves; and, last of all, topographical, or, as I prefer to call it, relational anatomy.

In this scheme no separate place is assigned to embryology, a subject usually treated in obstetrical and physiological works, as well as in anatomical. By agreement with my colleague in physiology, its systematic presentation is made by him; but all through my course the facts of development are introduced, not only to inform the student upon points of practical moment, but also to illustrate and enforce many features of adult structure.

At the end of his first year in the school the student is required to pass a satisfactory examination in histology, splanchnology, and osteology, and he is not permitted to enter upon second-year studies until he has so passed. At the end of his second year he is examined on the remainder of systematic and all of relational anatomy, failure excluding him from his third year.

It will be observed that I have confined my remarks strictly to the subject announced, and have refrained from discussing the relative merits of various methods of imparting instruction, as by lectures, recitations, demonstrations, and so forth. I wish it to be understood, however, that, if any expression of mine has seemed to imply that the old-time method of teaching by lectures holds the first place in my esteem, I have unwittingly done an injustice to a cherished conviction; for the lecture system, as an exclusive, or even principal, method of instruction, has long seemed to me to be the worst which has been devised.

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CURRENT NOTES ON PHYSIOGRAPHY (IV).

MERRIAM ON THE DISTRIBUTION OF ANIMALS AND PLANTS.

A study that is admirable, alike in its quality and its results, has been presented by Dr. C. Hart Merriam in a vice-presidential address to the National Geographical Society of Washington, under the title, 'Laws of temperature control of the geographical distribution of terrestrial animals and plants' (Nat. Geogr. Mag., VI., 1894, 228–238). The life zones of the United States, as mapped two years ago (Ann. Rep. Sec'y Agriculture, 1893), are now shown to be limited northward by the total quantity of heat during the season of growth and re-

production; and southward by the mean temperature of the hottest part of the year. The 'total quantity of heat' is measured by the sum of the excesses of mean daily temperature over 43°; this temperature being taken as marking 'the inception of physiological activity in plants and reproductive activity in animals.' The 'hottest part of the year' was arbitrarily limited to the six hottest consecutive weeks of summer. The life zones, the northward control, and the southward control are shown on three maps; and the accordances between the controls and the zones are truly surprising. The peculiar over-lapping of boreal and austral types along the Pacific coast, hitherto not clearly understood, is thus shown to obey the same controls as those which elsewhere keeps these types apart; the western coast being exceptional in having a great total quantity of heat, but a very mild summer. The dependence of these temperature controls on general geographical features offers a beautiful illustration of the general principles of climatology.

HARRINGTON'S RAINFALL CHARTS OF THE UNITED STATES.

A QUARTO paper of text and tables and a large atlas of charts, entitled 'Rainfall and Snow of the United States, Compiled to the end of 1891,' by Mark W. Harrington, chief of the Weather Bureau, has lately been issued as Bulletin C, of that office. It is based on all available records, of very different periods and values, but constituting the best body of material now in hand for the study of precipitation in this country. The charts exhibit the monthly, seasonal and annual rainfall, monthly maxima and minima, and many other details. The text calls attention to the chief features in the distribution of precipitation, both in place and season. The unusually heavy rainfall in the southern Appalachians, averaging over sixty inches, and exceeding ninety inches in 1892 at one station, is a new feature. It may be doubted whether the rainfall of the more mountainous belts is in general sufficiently represented. For example, Pike's peak is the only mountain meteorological station in Colorado, and its rainfall (30″) is greater than that of any other station. It might therefore be taken as indicating the rainfall on the mountains of Colorado in general; but, although there are many other lofty peaks, the isohyetal line of 30 inches does not include them. One might, to be sure, in the absence of direct observations, feel some hesitancy in asserting that these other summits actually have a 30-inch rainfall; yet one might feel equal hesitancy in asserting, as the charts do so emphatically, that the high peaks in general have not a 30-inch rainfall. It is stated that "in general the rainfall decreases also with the elevation above sea level;" and the decreased precipitation in passing westward across the Great Plains is taken as an illustration of this generalization. It is questionable whether the illustration is pertinent; for other controls, such as distance inland and relation to mountain ranges, are here presumably of much greater importance than increasing elevation. It is to be regretted that, in the interests of a consistent terminology, Florida should be cited as a region of 'subtropical' rainfall. Florida is a region of summer rains; while regions of subtropical rainfall always have their maximum in winter, as in the region originally so named by Dove, around the Mediterranean, and again with equal distinctness in California, Chili, South Africa and South Australia. The southeastern coast of Asia has a summer rainy season, like Florida; and Florida might therefore with some justice be likened to the regions of monsoon rainfall, but this would hardly do justice to its other relations. As a matter of fact, no technical name has yet been suggested for seasonal rainfall of the Florida kind.

BAROGRAPH RECORD DURING A TORNADO.

The general fall of pressure during the passage of cyclonic storms is an old observation. The short-lived rise of pressure during the onset of a thunderstorm is of more recent detection. The inferred very low pressure in the funnel of a tornado has never been tested by direct observation, unless the tracing of a barograph at Little Rock, Arkansas, on October 2, 1894, may show an effect of this kind. The tornado passed over the Weather Bureau station at 8:28 P. M. of that day, and although the upper story of an adjacent building was blown upon the station, the instruments on its roof generally destroyed, the windows blown in and the furniture drenched with rain, the barograph bravely continued its record; and its interesting curve is reproduced in the Monthly Weather Review for the month in question. As the tornado passed there was a momentary fall and rise of 0.38 inch. Shortly afterwards the storm passed over the gas works, and all the lights in the city went out as if by relief of pressure from the gasometer. As soon as the cloud passed, the tank settled again, the pressure was resumed, and the gas jets could be lighted. Professor Abbe, editor of the Weather Review, points out that the sudden change of pressure recorded on the barograph curve may have been merely a local effect of decrease of pressure by wind suction up the chimney, followed by restored pressure when the windows were broken in; so the inferred low pressure of the tornado funnel still eludes unquestionable record.

NEW YORK STATE WEATHER SERVICE.

The fifth annual report of the New York State meteorological bureau and weather service, of which Professor E. A. Fuertes, of Cornell University, is director, is perhaps the most elaborate and valuable of any of the State service reports yet issued. Besides the summaries of monthly reports for all stations for 1893, with good charts of temperature and rainfall from records at about one hundred stations, there is a comprehensive chapter on the climate of the State, by E. T. Turner, meteorologist to the State service, with a number of interesting plates and charts. For example, the curves of daily mean temperatures and pressures exhibit to a nicety the greater fluctuations of these elements in the winter, when cyclonic action is increased, than in summer, when it is diminished. A neatly tinted map, shaded for elevation, gives a clear idea of the general relief of the State. The few elevated stations in the Adirondacks have a higher mean winter temperature than those in the St. Lawrence valley, more than a thousand feet lower; a notable example of this inversion having occurred under an anticyclone on December 8, 1890, which is illustrated by a special chart. Nocturnal winds, flowing northward past Ithaca to Cayuga Lake, are described as characteristic of the valleys of the southern plateau; they occur on clear nights, both winter and summer, beginning one or two hours after sunset and reaching a velocity of about eight miles an hour before morning. The thickness of this current, as determined by balloons, is only from fifty to a hundred feet. Apart from the immediate value of so well managed a service as this, in the way of displaying weather signals and distributing crop reports, it deserves hearty support from the State in its long task of collecting and discussing authentic climatic data. The number of reporting stations should, however, be largely increased, and for this purpose the service cannot do better than foster the adequate teaching of meteorology in the public schools, both by the publication of special articles serviceable to teachers, and by making these articles known at teachers' and farmers' institutes.

ARGENTINE METEOROLOGICAL REPORTS.

AMONG the most elaborate discussions of meteorological observations published in America are those of the Argentine Meteorological Office, under the direction of Walter G. Davis, whose headquarters are at Cordova, in the middle of the pampas. The latest volume issued, number IX., is in two parts; the first giving the original observations at Cordova since 1872, the second giving the mean values determined from this important series of records. A notable climatic feature is the occurrence of a wet summer, October to March. and a dry winter, April to September, The summer rains are chiefly supplied by thunderstorms, yet curiously enough the rains exhibit both in quantity and in number of occurrences a distinct afternoon minimum and an early morning maximum; but the scale of cloudiness has its maximum toward midday, and in January in mid-afternoon. High barometric pressure confirms the continental quality of the winter dry season. Westerly winds are rare; northeast and southeast are common, the latter flowing feebly through the night, the former actively through the afternoon; and thus indicating the left-handed or austral deflection that might be expected with increased velocity in the southern hemisphere. The strong diurnal winds last from ten to five o'clock in late summer, but only from noon to three in midwinter; while the duration of the quiet winds of night plainly varies with the period from sunset to sunrise. Although the text and tables are most elaborate, the treatment of the subject is local, numerical and climatic, rather than general, descriptive and meteorological.

THE SPECIOUS TERM, 'REFORESTATION.'

THE hard times lately reported as afflicting some of the Western States in the debatable belt, where agriculture is an uncertain occupation, recall by contrast the over-confident opinions, so freely uttered by 'experts' before Congressional committees, concerning the improved climatic conditions that might be expected over the Great Plains as settlement advances. Governmental science will, we fear, suffer severely when the inaccuracies of this quasi scientific testimony are understood. Hardly less misleading than the loose phrases concerning 'the underflow,' from which an inexhaustible water supply has been looked for, is the term 'reforestation,' used with the implication that the barren plains of to-day have been forested in the past. One official has testified: "By the destruction of the forest which originally covered this region, the very condition of its existence and of its natural recuperation was destroyed; and thus, in a reverse manner, reforestation of parts by artificial means may make natural reforestation over the whole area possible by and by. . . . Reforestation on the plains and forest preservation on the mountains is of greater national concern than the location of irrigation reservoirs." There is no shadow of evidence that the Plains have ever been forested since their geographical surroundings were like those of to-day. It is a most gratuitous assumption to use the term 'reforestation' in writing of the Plains. It does harm to those who are tempted to settle there by these and other over-favorable views concerning the climate of the sub-arid region; and it discredits governmental science by exposing it to so easy contradiction.

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ANNUAL RECEPTION OF THE NEW YORK ACADEMY.

THE New York Academy of Sciences last year instituted a series of annual receptions, suggested by the famous *conversazione* of the Royal Society of London. The first Reception was held in the Library of Co-