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CHAPTERS VI-VIII.

[See page 159, Monthly Weather Review, April, 1905.]

Practical laboratory work in observing, computing, charting, and forecasting, as well as special studies, are expected of the students. At the close of the course, if time permits, a few lectures are given on climates, floods, river stages, atmospheric electricity, optical and acoustical phenomena of the atmosphere.

CONTRIBUTIONS INVITED.

It has occurred to the Editor that possibly among Weather Bureau officials, cooperative observers, and other readers of the MONTHLY WEATHER REVIEW there are some who would occasionally like to send in an article for publication, but refrain because they have not been invited. The majority of the articles that appear in the REVIEW have been voluntary contributions and are of an unofficial character. The Chief of Bureau does not order them written and the Editor is allowed the liberty of publishing whatever will be for the benefit of meteorology. He hopes, therefore, that no one having an interest in the progress of this science will refrain from writing because he has not been invited. None of the articles that appear are to be considered as embodying principles or instructions obligatory upon the service unless, indeed, it is expressly so stated by order of the Chief. Inasmuch, therefore, as each author has the liberty of expressing his own opinion, there is no reason why there should not be a free expression of views on any topic that comes up for discussion. Of course it will sometimes happen that an article may be submitted that can not be published immediately or that may need considerable modification before appearing in print. In such cases the criticisms and advice of the Editor and his assistants will always be at the service of our correspondents.

A CAUTION AS TO HYPOTHESES.

An editor does not always feel free to decline articles offered for publication by distinguished investigators, in fact he usually welcomes new ideas as being the best stimuli to other minds. But he should call the attention of younger students to the danger of piling one hypothesis upon another, building up a work of the imagination that is beautiful to contemplate, but not necessarily in complete harmony with nature. It is much easier for man to describe how the Creator might have done, than to get at the facts of the universe that surrounds us and of which we form a part.

Hypotheses are the essential steps to every investigation. We always try many before we find something that harmonizes through and through with observations and may be temporarily accepted as an apparent law of nature. The investigator often publishes a full statement of his successive trials of hypotheses and their failures as an explanation of the long time required to get at the truth. Other students in the same line of work profit by reading such statements and learn not to be carried away by the enthusiasm inspired by a first apparent happy thought. Some of the most distinguished men in science have been conspicuous for the tenacity with which they adhered to hypotheses that have ultimately been abandoned. Thus, in the struggle to wrest from nature her greatest of all secrets, the structure of a molecule, the theory of Boscovich has had an almost pernicious influence, but may begin to yield good results when we are able to modify it by adding the dynamic considerations that have developed during the past few years. In astronomy the cycles of the ancients reigned supreme for 2000 years until Copernicus, Kepler, and Newton permanently dislodged them. Newton, himself, says "I will not touch hypotheses," and yet he was perpetually discussing them and rejecting them one by one. His theory of universal gravitation was indeed an hypothesis until he was able to demonstrate its validity by utilizing Kepler's rules which were based on observations. In his "Treatise on Optics" he introduced an hypothesis relative to the nature of light whose defense enlisted all the energies of his followers, until the battle was given up two centuries later in favor of the so-called "undulatory theory of light" and even this latter now stands in need of modification.

The mathematician deals with matters of pure hypothesis and logic, but the physicist deals with a material world that he must measure and weigh.

Many illustrations might be cited to show the inadvisability of building up a complex structure of mixed hypotheses and well established facts or laws that is apt to become undermined and eventually to tumble down. The wisest way is to admit only one hypothesis at a time and not build upon it very much until its validity has been established beyond all peradventure. Our contemporary, Nature, has adopted from Wordsworth a line that should serve as a motto for all true lovers of meteorology:

> "To the solid ground
> Of nature trusts the mind which builds for aye."

Not but that we shall make many mistakes in endeavoring to follow nature. We may often deceive ourselves and sometimes be inclined to say that nature deceives us. We often wish to push ahead to the very end of the whole matter, when nature says "Stop right here, the world is not yet ready for the answer to this question."

CORRIGENDA ET ADDENDA.

Page 292, fig. 64, insert the following legend: "Retardation of rotation in different zones of the sun." Page 293, fig. 68, insert the following legend: "The upper section shows the variation in relative number of sun spots in an 11-year period, and the lower section shows the corresponding changes in the