and it is advisable to express as much in the labels as may suffice for a pretty complete knowledge of the objects labeled. If this notion is a correct one, let us welcome the designation of *differences* in rocks by their names, and not seek to lose sight of these differences in contemplating simply likenesses. On the other hand, it is well to exercise care in the selection of types to be named, so as to avoid as far as possible the lumbering of the terminology with needless expressions. Discrimination must, of course, be exercised in the naming of types, and experience must decide as to the value of any proposed name. The writer would prefer that the *varietal* names should be based upon mineralogical composition, and that adjectives should express the structural *differences*, where the structure of the variety departs from the characteristic structure of the group.

CLOUD CLASSIFICATION.

BY CAPT. DAVID WILSON-BARKER, R N., H.M.S. "WORCESTER," ENGLAND.

FOR some years meteorologists have been in doubt as to the nomenclature of clouds, greatly to the retardment of this important and practical branch of the science. The nomenclature of Luke Howard answered very well for a time, but with our advanced knowledge it scarcely answers at all. It is not simple enough for beginners, nor elaborate enough for those well advanced. Many of the systems proposed lately are simply modifications of this old nomenclature, and retain its faults. Unfortunately, in cloud classification we are met with many difficulties at the outset, we cannot collect and label clouds in a cabinet for reference, but here photography may aid us much. From personal experience it has been found quite possible to portray even the most delicate and fleecy clouds with sufficient accuracy to leave no doubt as to their type. It is proposed in this article to lay before the readers of *Science* a simple scheme of cloud nomenclature suitable for beginners and those unable to devote much time to the study. On this simple scheme can be founded a more elaborate system for skilled nephologists.

It will soon strike any one who notices weather phenomena ever so casually, that clouds have a tendency to assume one of two well-known forms or shapes, either a heapy or globular form, or that of thin sheets or layers. Clouds in the first form are known as cumulus (cumulus, a heap) clouds. In the second as stratus (stratus, a layer) clouds. Once it is clearly understood that all clouds be divided into these two types as a starting-point, and belong to one or other of these types, the question of a minute sub-division becomes, comparatively speaking, easy.

It may be well to give here a cloud definition. *A cloud is vapor, which has ascended or descended in the atmosphere from a position having a temperature or density greater than the portion of the atmosphere it ascends or descends to, which is then unable to retain it in its invisible form. According to the physical state of the position it is attracted to, so will be the form it will assume on becoming condensed.* It will be seen from this that the shape of a cloud is more or less determined by its physical surroundings, and consequently it affords a valuable index, not only to the state of the immediately surrounding atmosphere, but also to the weather we may expect, and this frequently some time before any instrumental warnings are indicated.

Cumulus is essentially the cloud of the lower atmosphere, as, although it sometimes tops to great altitudes, yet its formation commences at a, comparatively speaking, low level. Cumulus clouds assume varied and fantastic shapes, and vary very often from clouds of enormous extent to small nubecules, still there is in them a distinct and marked similarity, which must be easily recognized. There are three forms of cumulus clouds from which rain falls, viz.: 1. Bold, massive cumulus with feathery tops, which appear to be composed of ice crystals, and are like the high variety of stratus known as cirrus; 2. bold, massive cumulus with all clearly defined borders, only seen in the tropics; 3. fleecy, ill-defined cumulus. The first may be accompanied by either snow, hail, or rain, with a decided increase of wind, and, in fact, is a squall, which often gives warning hours before it reaches the observer. In the second is heavy rain with little increase of wind-force, and at sea is the kind of cloud which sometimes accompanies waterspouts; and the last has only drizzling rain and no increase in wind-force.

Stratus is formed in all layers of the atmosphere. On the ground it is fog, in the lower atmosphere as covering the sky oftentimes for days in anticyclone areas; in the middle layers in broken-up or more or less circular patches constantly, though erroneously, called cirro-cumulus or cumulo-cirrus, and in the highest layers as the well-known cirrus or curl-cloud. It is the cloud of the finest settled weather, and also of the front of cyclonic disturbances, but there can be no mistaking these two conditions. In the former case, it forms a pall over the whole sky, perhaps broken here and there by a rift, through which a blue sky, quite free from other clouds, may be seen, and appearing in all directions in lines parallel to the horizon. The first sign of any change is preceded by the disappearance of this cloud, and the formation of fine threads of cirrus over the sky; these threads gradually grow closer and closer together until the sun or moon shines through surrounded by a halo. As the cloud gets thicker (seems to grow in the air) this too disappears, rain begins to fall, and a cyclonic disturbance is well under way. In the first case the stratus was in the form of a cloud of great superficial extent and small depth, in the second it has great depth and uniformity of texture.

Cloud observing is a difficult branch of meteorology, yet no great advances can be made in the physics of the atmosphere until we have a better knowledge of its movements, and this article is written in the hope that those interested in the subject may not be appalled by the apparently hopeless condition of cloud nomenclature. For if we could have a series of observations taken carefully on even this simple basis, they would be of more value than the majority of observations taken now; and this especially applies to observations at sea, as it is to the sea we must look for the most valuable meteorological observations. Personal experience has shown that observers, while finding it comparatively easy to distinguish between cumuliform clouds and stratiform clouds and the different altitudes at which they float, yet often make great mistakes when they have to deal with the subdivisions as they are at present determined.

NOTES AND NEWS.

FIVE lectures on anthropology are to be given on Monday afternoons by Daniel G. Brinton, M.D., LL.D., at the Philadelphia Academy of Natural Sciences, admission free. Tickets can be obtained at the Academy from Dr. E. J. Nolan, secretary. Feb. 13, The Bonds of Social Life; Feb. 20, The Growth of the Arts; Feb. 27, The Progress of Religions; Mar. 6, Language and Literature; Mar. 13, Folk-Lore, or the Past in the Present.

— The Royal Academy of Sciences of Turin announces that the ninth Bressa Prize, consisting of 10,416 francs, will be awarded to any scientific author or discoverer who, during the years 1891–94, shall, in the judgment of the Academy, have made the most important or useful discovery or published the most valuable work on physical and experimental science, natural history, mathematics, chemistry, physiology, and pathology, as well as geology, history, geography, and statistics.

— From the American Book Company we have received the four latest volumes of their English Classics for Schools. They are: "Ivanhoe," by Sir Walter Scott (484 pages, 50 cents); "Julius Cæsar," by Shakespeare (114 pages, 20 cents); "Ten Selections from the Sketch-Book," from Washington Irving (149 pages, 20 cents); and "The Sir Roger de Coverley Papers," from the *Spectator*, by Addison, Steele, and Budgell (148 pages, 20 cents). The first-named volume is provided with a serviceable glossary, and all are well printed, on good paper, and are neatly bound.