The first chapter of this Volume IV treats of the laws of atmospheric motion, and a lot of things incidental thereto. Indeed, it is an excellent summary of a considerable portion of classical physics—harking back to the era of sanity when he studied under Helmholtz and taught at Cambridge. It is in this chapter that, like Rücker in 1889 (*Phil. Mag.*, Vol. 27, p. 105), he finds for absolute temperature the same dimensions as those of kinetic energy per unit mass. In this connection the reviewer regrets that Sir Napier passed by an excellent opportunity to say another good word for entropy which he has so effectively and abundantly used in his discussions of the atmosphere and its motions. He might have, as did Tolman (*Phys. Rev.*, Vol. 9, p. 247, 1917), regarded entropy as a fundamental quantity and from the expression $T=\frac{dQ}{dS}$ found for absolute temperature the dimensional value $ML^2T^{-2}S^{-1}$, that is, energy divided by entropy. This is very interesting, but no doubt most of us, in practice at least, shall continue using temperature in our equations and calculations as just a number on a scale, wholly without dimensions of any kind.

The second chapter, covering 50 pages, shows ways of applying mathematics to the problem of the movement of a parcel of air over the rotating earth, when subject jointly to the urge of an active push and the restraint of viscosity and turbulence. Here Sir Napier makes some portions delightfully easy, while others he leaves to the reader's own ingenuity and amusement. The rest of the book affords relatively easy and sure going, except, of course, over the many parts where knowledge of the way still is seriously deficient.

The next seven chapters give detailed accounts of the phenomena to which the mathematics of the second chapter apply, with numerous interesting and profitable side excursions. Sir Napier knows too much of his subject to be content to follow a straight and narrow course from premise to conclusion, nor are his readers willing that with such knowledge he should do so.

To the American readers of these chapters, in which a number of striking numerical values are given, a note of warning is in order. Sir Napier always uses the full-weight ton of 2,240 pounds, not our short-weight ton of 2,000 pounds. Again, when he says billion he means a sure-to-goodness British billion of a million million, and not our diminutive billion of only a thousand million.

The last chapter in this, the final volume of Sir Napier's great manual, is an appropriate and excellent retrospect over the whole present field of meteorology, in which he himself has been a most industrious and efficient worker—a retrospect, however, that closes with a stimulating urge to further good work in the future.

And now another warning: Don't think that when the excellent eleven-page index is reached the book is done, for after that, instead of the customary blank leaves, is a two-page postscript worth reading; and even after that, in turn, a convenient summary of the contents of the entire manual.

Now that this great work is available to all it might be supposed that the meteorological millennium at last had come, but it has not come, and it will not have come until the upper personnel, save only the business element, of every considerable meteorological service have fully mastered it and at least the dozen next best treatises on the air and its ways; nor, further, until they themselves, and those in line to follow them, have become creative workers in this same limitless field. All must agree that such a state of affairs is urgently needed. Furthermore, it is entirely possible to effect and, moreover, rapidly coming to pass.

W. J. HUMPHREYS

My Nature Nook. By W. S. BLATCHLEY. Pages 1–302, and 15 half-tone plates. The Nature Publishing Company, Indianapolis, 1931.

IN January, 1913, Dr. Blatchley went to the Gulf Coast of Florida from the rigors of an Indiana winter to find a place where he might spend a few months each year living an outdoor life in pleasant surroundings. He wished a place where he might be surrounded by a fauna and flora yet primitive and undefiled, where he might live in close daily contact with interesting trees and shrubs and the shy live folk that dwell among them. He selected Dunedin-on-the-Gulf, some twenty miles north of St. Petersburg, and has been going there each winter since. A short distance from the little town he found a secluded spot near Clearwater Bay and there he purchased a few square rods of land which he calls "My Nature Nook." He built a comfortable small house in which to live when bad weather makes it necessary to stay indoors. He then began seriously and with enthusiasm to examine the little patch of ground which was the first primitive spot of mother earth which he ever had that he could call his very own. He studied it in great detail, vastly more minutely than did Gilbert White the region which he made famous in that classic, "The Natural History of Selborne." Blatchley selected an old leaning oak tree, in a fork of which he made a comfortable rustic seat where he could sit, observe and think and write. And what he thought is duly set down in this book.

Blatchley is an old-time naturalist, a real naturalist in the broadest and best sense, as were Gilbert White, Rafinesque, Darwin, Agassiz, Audubon, Coulter and David Starr Jordan. They knew animate and inanimate nature as they saw her in the open. And so it was that Blatchley, being a naturalist and a philosopher, wrote so interestingly about the animals and plants which he saw in his Nature Nook near Dunedin. He tells the story in the form of a diary, in which he records from day to day his observations, his interpretation of their meaning and his philosophizing about the relations of plants and the lowly animals and human beings. The three hundred pages of this book are filled with fascinating accounts of the interesting habits of many of the animals and plants of the region.

Dr. Blatchley is primarily an entomologist, but he is more than that; he is also an excellent botanist and knows not a little about birds, mammals, reptiles and shells. His style as a writer is delightful, reminding one of Thoreau and Bradford Torrey. "My Nature Nook" is one of the most fascinating of recent nature books and should have a large sale.

BARTON WARREN EVERMANN

SCIENTIFIC APPARATUS AND LABORATORY METHODS

AN APPARATUS FOR COUNTING SAND GRAINS

THE counting of sand grains is destined to play an important part in the analysis of sediments. In the past grain counting has always been done with the naked eye or under the microscope, but either of these methods requires much time and patience. The following apparatus, based on principles used in seed-counting devices, was designed to afford a quick and accurate method of counting rock particles.

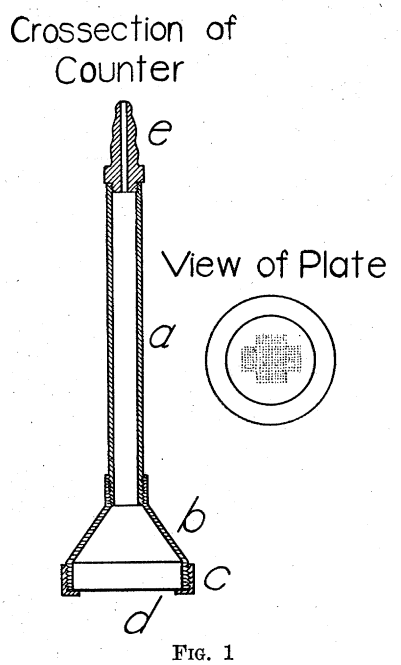

FIG. 1

The apparatus consists of a brass tube, a, having an inside diameter of ½" (1.27 cm). A small brass nozzle, e, is screwed in one end to facilitate the attachment of a rubber hose. At the other end is a funnel shaped brass cup, b. A clamping ring, c, fits onto this cup and clamps a thin brass plate, d, to it. This brass plate contains a definite number of small holes which must have smaller diameters than those of the particles to be counted.

A rubber hose is connected to e and attached to a filter pump or other suitable suction apparatus. The instrument is then ready for use. When the plate is brought in contact with dry sand grains whose intermediate diameters are larger than those of the holes in the plate, a single grain is attracted to each hole and held there by suction. In practise this suction must be regulated so that it is not too strong, otherwise a miniature mound of sand will be held to the plate. It has also been found necessary to blow gently over the face of the plate or to use a small brush and needle to distribute the grains evenly. A few of the holes will hold more than one grain, and a few will not hold any, but holes that do not hold grains are balanced by those holding more than one, so that the resulting maximum error averages less than 2 per cent. for the count. With careful manipulation of small brush and needle even this error can be eliminated. A 300-hole plate drilled with a No. 80 twist drill (about .333 mm) gives satisfactory results for the .50–.35 mm grade size.

The following table shows the results obtainable with the above-mentioned type of plate. The time required to count 10,000 grains was about an hour.

Kind of fragments	No. by 300 grain capacity plate	Weight of 300 grains	Weight of 3,000 grs. by counter	Computed weight of 3,000 grs.	Difference	Per cent. of error.
Oolitic sd.	301	.0505 g.	.4910 g.	.505 g.	.014 g.	2.8
St. Peter sandstone..	302	.0345 g.	.3441 g.	.345 g.	.001 g.	.03
Beach sd.	304	.0310 g.	.3009 g.	.310 g.	.009 g.	2.5