grants, which will be adjusted according to the circumstances of each case. The duration of grants will normally not exceed two years. Fellows will usually be required to work at or in connection with a recognized center of research, either at home or abroad. The following have accepted their invitation to serve on an advisory committee for the selection of fellows and for the general supervision of the scheme: Dr. H. J. W. Hetherington (chairman), Professor A. M. Carr-Saunders, Sir William Hardy, F.R.S., Dr. N. V. Sidgwick, F.R.S., and Mr. H. T. Tizard, F.R.S. Dr. L. Haden Guest has been appointed secretary.

DISCUSSION

HONOR BESTOWED ON DR. DAVID EUGENE SMITH BY THE SHAH OF PERSIA

To the many friends, colleagues and former students of Dr. David Eugene Smith, professor emeritus of mathematics, Columbia University, it will be interesting to know of the appropriate and appreciative recognition recently bestowed on him by H. I. Majesty, the Shah of Persia.

During an absence of four months last winter and spring, spent chiefly in Persia, Iraq and Syria, Dr. Smith traveled by motor upwards of 10,000 kilometers from the time he left Haifa until he reached Turkey. He secured more than 150 manuscripts—mostly Persian, Arabic and Hebrew. Among them were several mathematical pieces of importance, chiefly Arabic translations from the Greek classics, together with a 14th century manuscript of Omar Khayyám's algebra. The translations from the Greek include two Euclids, Archimedes on the circle, and Aristarchus on astronomy. Also he supplemented his early 19th century manuscript of Ulug Begh's tables by three other earlier sets. In the lot were commentaries on al-Khowārizmī's algebra and Beha Eddin's arithmetic.

His collection, which contains also manuscripts of works on the Persian poets, he enlarged by copies, usually with miniatures, of the classics of Ferdousi, Hafiz, Sa'di, Omar Khayyám, Nazāmī, Omar ibn Ghares and others. His large library of Korans and Koranic literature, a few specimens of which are now in the Islamic exhibition in the Metropolitan Museum (New York), was greatly enriched by about 100 additional manuscripts, several with unusually fine decorations and bindings. These acquisitions will form part of his personal library of over 20,000 items which he has presented to the library of Columbia University (the educational works to the special library of Teachers College).

It is well known that mathematical scholarship has a correlation with musical interpretation and appreciation, but seldom with poetical temperament and metrical construction.

In appreciation of Dr. Smith's new metrical version of Omar Khayyám's "Rubáiyát" in 289 quatrains, which was the first work to be worthily illustrated by a Persian artist of high standing, and in recognition of his interest in the mathematical achievements of the country, the Persian Government conferred upon him, in the presence of a distinguished audience, the gold star of the Order of Elim, decoration of the first rank. After an address by Professor Smith, who was introduced by H. Highness Feroughi, Minister of Foreign Affairs, the presentation was made by H. Highness Esfandiari, the oldest of the former ministers of state. The addresses upon the occasion were published in full in the Persian papers, in some cases with an English summary. An autographed portrait of H. I. Majesty, the Shah, was also among the highly prized souvenirs which were presented to him. He gave addresses in several of the cities and visited a number of the important excavations now in progress in Syria, Iraq and Persia.

Since his retirement from Columbia University, Dr. Smith has profitably engaged in accumulating a unique collection of books, manuscripts, letters and portrait prints of great value to the history of science, and more particularly of value to the history of mathematics. This is to-day probably the most outstanding collection of its kind gathered together by a single individual.

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EXPEDITIONS

IN the current number of *Natural History,* Mr. James L. Clark has a very instructive article on "Expeditions," in which he gives advice to those who contemplate journeys abroad for scientific purposes. While thoroughly appreciating the wisdom and experience represented by this article, I refer to it now for the purpose of emphasizing some points which are, it seems, not generally appreciated. Mr. Clark says: "Expeditions are necessarily expensive," and goes on to discuss how they may be financed. He himself has been chiefly interested in securing specimens of the larger mammals, but of course these constitute only a very small part of the fauna. It should be emphatically stated, at the present time, that expeditions to many places and for many purposes require only moderate funds, and that there is no direct relation between the amount of money expended and the scientific results. The world has greatly changed in these respects within my memory. As a

boy, I used to look with wonder and curiosity at the large blank spaces on the map of Africa. I was quite old enough to have been present at the discovery of Lake Kivu, had I been exploring Africa at that time. These regions were either inaccessible, or were only reached at the cost of much time, labor and money, with some risk to life. Now we go with comfort and speed, and the cost is quite moderate. But the fauna and flora are still there, excepting only some of the larger animals which have been decimated or exterminated by hunters. It is true that many of the more interesting discoveries have already been made and recorded, but the wealth of novelties still remaining is almost beyond belief. Field observations on the habits of many groups of invertebrates have scarcely more than begun. It does not in the least detract from the scientific results of an expedition that it is far easier and cheaper than formerly; on the contrary, the harvest is likely to be greater and more valuable, because the conditions are better.

As Mr Clark rightly insists, there should always be "definite purposes and objectives." Those who have no such purposes rarely accomplish much of value. Nevertheless, it is important to be prepared for the unexpected. I am constantly asked, when about to start on an expedition, "What do you expect to find?" I often answer, "I expect to find what I do not expect to find," a seeming paradox explained by referring to the enormous complexity of nature and the innumerable surprises it affords.

Thus it appears that amateurs, without very much training or large resources, can do important work for science. They can also get a great deal of pleasure and interest for themselves, and may take a justifiable pride in the results. It is necessary, however, to get the materials worked up and the results published. Collectors must be content, as things now are, if by far the greater part of their collections reposes on the shelves of museums, awaiting the touch of a posterity perhaps not yet born. I have had occasion to describe bees collected on the famous voyage of the *Beagle*. But it is often possible to find specialists who will more or less promptly attend to the groups they are interested in, so that the members of an expedition will not have to wait too long to ascertain whether they were successful. Better organization is needed in respect to these matters. Thus, it would seem worth while for any large museum to issue a circular or pamphlet, setting forth the desiderata which could be dealt with promptly. Yet even in the case of groups which find no students, an active worker may appear at any time and utilize all that has been gathered up to date.

One thing reacts on another. If there were more amateurs, anxious to collect scientific materials and study them, as far as their training and circumstances might permit, there would be more interest in and support for the specialists whose cooperation is needed. There would be better chances for publication, and books would begin to appear, which would make many matters intelligible to those having a reasonable amount of scientific curiosity. The general result would be an increase in the cultural level of the people, something sorely needed at the present time.

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ALFALFA YELLOWS

BECAUSE the extent of the injury sustained by agronomic plants from insects is governed by a complex of factors involving environmental reactions of the host plants and their relations to the habits and populations of the parasites, there are, at times, simple agronomic procedures that prove to be effective remedies. Such is the case with the stunting and yellowing of alfalfa that is caused, primarily, by leafhoppers (*Empoasca fabae*). In Wisconsin this injury appears primarily in the second growth, and that it is definitely associated with increased populations, resulting from early cutting of the first crop, is made clearly evident by cutting trials of alfalfa and population counts of leafhoppers during the past two years.

Since leafhoppers do not usually appear in alfalfa fields in large numbers until the plants are near blossoming, their injury is not, as a rule, of great importance with the first cutting of hay. When this cutting is deferred until the field shows abundant blossoming the adults will have laid in the green tissues of the alfalfa the major portion of the eggs of this brood. Such eggs are removed in the first crop of hay before they hatch into nymphs, thus greatly reducing the populations in the second growth. With earlier cuttings of the first crop, egg deposition, not being completed, is continued by surviving and migrating adults, often resulting in large populations of nymphs, which in specific trials this past season reduced the productivity of the second growth of alfalfa from 66 to 75 per cent. Thus, cutting one half of each plat of a series on June 9 resulted in a stunted yellow growth of the second crop in which, on July 15, there were present 29 times as many nymphs as were found in the healthy growth of alfalfa in the adjacent areas where the first crop was removed on June 21. Since these nymphs are relatively static and do not begin to migrate until they have approached the adult stage, alfalfa prevailed in adjacent areas of the second clear-cut contrasts of short yellow and tall green