

vegetable products of the Perso-Afghan region which are articles of commerce with India and other countries. Much uncertainty existed respecting the plants yielding some of these drugs, dyes, and other substances, and no more welcome contribution to botanical knowledge could be made than the removal of this uncertainty.

The Commission left Quetta in September 1884, taking a south-westerly direction as far as Nushki, and thence the course was north-westward across Northern Baluchistan to the Helmund River, which was touched in about 63° E. long. This section of the journey produced little, as the country is very barren and the season in which it was traversed the worst of the year for botanising. Nevertheless a few interesting things were picked up, notably ripe fruit and seeds of *Stocksia brahuica*, which were previously unknown. The fruit, or seed-vessel, is an inflated capsule, similar to that of the Chinese *Koelreuteria*, near which *Stocksia* is placed, and so brightly coloured that it bears a name equivalent to "mountain peach."

That part of the journey from the Helmund northward to Kuhsan, a little to the north-west of Herat, was accomplished at the rate of twenty miles a day, therefore there was little opportunity for collecting. Indeed the fatigue attending the travelling was so great that frequent dismounting to secure specimens of natural history was out of the question. In spite, however, of all drawbacks and difficulties, specimens of about one hundred species of plants were dried; and this collection was despatched to India, by way of Herat and Candahar, where it arrived in a rotten condition, having apparently been immersed, probably in crossing some stream, during the transit. The small collection made in Baluchistan had in the meantime reached Kew safely.

The main collection of dried plants, consisting of about 800 species in 10,000 specimens, was made in an irregular tract of country lying between about 59° and 64° of longitude and 34° and 37° of latitude, with Herat near the south-eastern, and Meshed near the north-western limits. This collection was the result of one year's work; yet it by no means represents the entire flora of the area in question, partly in consequence of the difficulties attending the daily transport of collections constantly increasing in weight and size, and partly on account of the necessity for keeping with the main party. These contingencies, rather than the resources of the country, determined the extent of the collection. Thus, for instance, Dr. Aitchison rarely reached an altitude of more than 5000 feet, so that he collected no portion of the vegetation of the upper zone of the country. However, as the mountain flora is of more purely botanical interest, while that of the plains is of special commercial importance, on account of the number of economic plants it contains, its absence is, from the economic point of view, the less to be regretted.

At present the collection has not been fully worked out; but it is estimated that it comprises about a hundred species previously unknown to science, besides largely supplementing the material in herbaria of many obscure plants. Its principal value, however, as already mentioned, lies in the number of usually very complete specimens of economic plants and their products.

Foremost in importance, and the characteristic and dominating feature of the vegetation of the plains, are the *Umbelliferae*. Some of these are of gigantic size, for herbs, and several of them yield valuable gum-resins, known in commerce as gum ammoniacum, gum galbanum, asafetida, &c. A special paper on these plants was read by Dr. Aitchison on December 8 before the Pharmaceutical Society, therefore it would be superfluous to enter into details here. Early next year will be published a full and illustrated Report on the whole collection, in which prominence will be given to the economic plants: such as have not previously been figured, or only in-

adequately figured, will be selected for illustration. Remarkable among the *Umbelliferae* not known to yield gum-resins are *Ferula oopoda*, Boissier, *F. suaveolens*, Aitchison and Hemsley, and *Dorema serrulatum*, Aitchison and Hemsley. The first we have identified with a described species, though the specimens are very fragmentary, and the description incomplete. It is a most singular plant, in which the bases of the cauline leaves are developed into large circular bowls, through a succession of which, gradually smaller upwards, the stem passes. The largest of these bowls are as much as a foot in diameter, and about two quarts in capacity. From his investigations on the spot, Dr. Aitchison is of opinion that these bowl-like expansions of the petioles do not serve the plant as reservoirs of water: possibly they may prevent the ascent of insects which infest and consume the fruit of many of the *Umbelliferae* of the region. *F. suaveolens* furnishes a kind of sambal, and the *Dorema* is a very distinct new one. These *Umbelliferae* form very beautiful miniature forests; *D. glabrum* growing as much as 10 or 12 feet high.

Among other economic products whose sources have been traced and good specimens of the plants secured, a yellow dye, largely imported into India, may be mentioned. It is furnished by an apparently undescribed species of *Delphinium*. Another dyeing material turns out to be the roots of a species of *Prunus* (*P. (Cerasus) calycosus*, Aitchison and Hemsley), remarkable in being apetalous; the petals being replaced by the coloured petal-like calyx-lobes. *Pistacia vera* Dr. Aitchison regards as undoubtedly indigenous in this region, and numerous other interesting facts of the same nature will be described in his Report.

In conclusion, it may be mentioned that Dr. Aitchison succeeded in bringing home his extensive botanical and zoological collections by way of the Caspian and Black Seas, in an admirable state of preservation. Of course, it will be understood that there is no difficulty in drying plants in Afghanistan and Persia. In fact, they are likely to get too dry, and consequently break and crumble to pieces in transport, especially when, as in this case, they are carried on camels and mules day after day; and it was only by the most careful and elaborate packing that the plants were prevented from being rubbed into powder.

W. BOTTING HEMSLEY

DEPOSITS OF VOLCANIC DUST

IN several recently-published papers,¹ Prof. George P. Merrill has called attention to some interesting deposits which are shown by careful microscopic study to consist of volcanic dust.

Samples sent by Mr. Zahn, of Nebraska, to the United States National Museum were supposed to be "geyserite," and similar materials are said to occur in Western Kansas, Eastern Colorado, and Wyoming. They were found in small patches or in beds up to four feet in thickness, covered by a considerable thickness of other deposits. Of this material Prof. Merrill writes as follows:—

"A glance at the samples was sufficient to convince the writer that they were not the result of geyser action, but were probably of volcanic origin. One was of almost chalky whiteness, very finely pulverised, and of a sharp, gritty feeling when rubbed between the fingers. The second was gray in colour, slightly coarser, and had, even to the naked eye, a flaky appearance. Submitted to microscopic examination, both samples were found to consist almost entirely of the minute particles of amorphous glass, such as originate from the fine pulverisation of a glassy pumice, with only occasionally a fragment of a greenish mineral that was apparently hornblende."

¹ "On Volcanic Dust from South-Eastern Nebraska" (*Proc. Nat. Mus.* vol. viii. 1885, p. 99); "Notes on the Composition of Certain 'Pliocene Sandstones' from Montana and Idaho" (*Am. Journ. Sci.* vol. xxxii. 1886, p. 199).

The figures given of these particles show that they closely resemble pumiceous dusts (see NATURE, vol. xxix. p. 587). An examination of the sandstones with which these dusts are sometimes found interstratified proved that they consist of well-rounded particles of triclinic feldspar, hornblende, and magnetite, and that they are therefore, like the associated dust deposits, of volcanic origin.

Among a series of so-called "Pliocene sandstones" collected in Montana and Idaho in 1871 by Dr. A. C. Peale, of the Hayden Survey, Prof. Merrill was able to detect similar pumiceous sands in a more or less pure state. In their microscopic characters several of these were found to be very similar to the pumice-dust which was thrown out so abundantly during the great eruption of Krakatão.

"All of the above-mentioned dusts yielded water when heated in a closed tube, and fused readily, with swelling, before the blow-pipe. Samples submitted to Mr. J. E. Whitfield, of the Geological Survey, for analysis, yielded results as follows:—

	Marsh Creek Valley, Idaho	Little Sage Creek Mountain	Devil's Pathway
Ignition	6'00	6'50	5'60
Water ¹	1'60	1'12	3'46
Fe ₂ O ₃ + Al ₂ O ₃	16'22	18'24	17'18
SiO ₂	68'92	65'56	65'76
CaO	1'62	2'58	2'30
MgO	trace	0'72	trace
Na ₂ O	1'56	2'08	2'22
K ₂ O	4'00	3'94	3'14
	99'92	100'74	99'66

Accepting the apparently well-founded conclusions of others to the effect that such dusts represent the extreme degrees of acidity of the lavas of which they formed a part, we are led to consider these as of andesitic or possibly trachytic derivation.²

Other similar materials have been examined from Bridger Creek, on summit of a hill near Bozeman, and in connection with fossil bones from the Niobara Loup Fork and Sweetwater regions. A sample obtained from the base of the Mazatzol Mountains at the edge of Verde River Valley is stated to be quite similar to that described from the east of the Black Hills of Dakota, described by Dr. Wadsworth,² and also to those previously described by Prof. Merrill from Nebraska. Other similar dusts have been obtained by the officers of the United States Geological Survey from Wray Station in Eastern Colorado, and from Norton and Phillips Counties, Kansas.

"In studying the probable origin or sources of these various beds, the distances which the dust can be carried by atmospheric currents is likely to prove of importance. It may therefore not be out of place to state here, that among a collection of pumices, ashes, &c., from the Krakatão eruption in 1883, and which were donated to the Museum by T. H. Houghton, was a small sample of the dust (36974) that 'showered on board ship *Beaconsfield* at the rate of one inch per hour for three days, in latitude 14° S., longitude 92° E., or at a distance of 855 miles from the scene' of volcanic activity. This dust is a very pure, nearly colourless, gray and highly pumiceous glass, the particles of which vary in size all the way up to 0.25 mm.

"As a matter of economic interest I may say in conclusion, that in Kansas and Nebraska these dusts are collected and sold in paper packages as 'diamond polishing-powder,' or put into soap which is sold for general scouring as well as for dental use under the name of 'Geyserte soap.'"

¹ Water given off at 105° C.

² *Science*, July 24, 1885.

THE POTATO TRICENTENARY

AN article on "The Origin of our Potato," which appeared in our columns on May 6, contained these words: "It would be a fitting observance of the third centenary . . . if we could celebrate it, not by speeches and after-dinner toasts to the memory of Drake or of Raleigh, but by clearly laying down our lines of inquiry, for they have been very ill-defined." These words, penned by our contributor with then no definite idea as to the way in which various thinkers could be brought together to help to lay down lines of inquiry, have had their effect. The proprietors of the St. Stephen's Hall took the subject up, and in a circular headed 1586-1886, printed in old English type, referred to the article in NATURE as drawing attention to the fact that 1886 was the accepted date for the tricentenary, and announcing their intention to celebrate it in the spirit suggested, with Conferences and an historic and scientific Exhibition, conjoined with a display of all known varieties of tubers that could be obtained. A "Scientific Committee of Consultation" readily offered their services to arrange the "historic and scientific" portions of the Exhibition and to conduct the Conferences. Leaving, as it was seen we were, the old lines of cultivation, and entering on a more thoughtful, a more scientific way of procedure, the turning-point appeared to demand a recognition of the past, an exposition of present knowledge, and something tangible of the on-look into the future.

The proprietors of the St. Stephen's Hall, while acting as the executive, and arranging the display of tubers, and offering gold, silver, and bronze medals, left all the scientific work to the Committee of Consultation. Those who first accepted their responsibilities had to seek the co-operation of others, and only those who were specialists in the portion of the subject they represented were invited to join it. In the list of sections as drawn up, the botanical aspects of the question naturally came first, and Mr. J. G. Baker, F.R.S., of Kew, undertook to illustrate "The Known Wild Species of Solanum," which he did partly by dried specimens and partly by drawings. No one was found to undertake the section "Batatas, yams, ighnamas, &c., that in Elizabethan times were called potatoes," but specimens of yams and so-called batatas were shown. Some uncertainty about the vernacular nomenclature of these seems to exist. The section "Cultivation by the Incas and other Andean Nations" was accepted by Mr. C. R. Markham, C.B., F.R.S., who in the Conference added more information than could be given in the form of an exhibit. For the next section on the programme, "Early Cultivation in the British Isles," no one could be found. This is a fact worth notice. There must surely be some one who has paid attention to this subject, yet even after the Committee was fully formed it was not known to whom to apply for information.

The next section, "Cultivation," with its sub-sections—(1) Selection, (2) Cross-breeding, (3) Hybridisation, (4) Grafting—was undertaken by Dr. Maxwell Masters, F.R.S.; and the following section, "Potato-disease," was well filled up with contributions from Mr. W. Caruthers, P.L.S., Mr. Worthington Smith, Dr. Plowright and Mr. Geo. Murray, F.L.S. For the section "Chemistry of the potato and batata as a food" Prof. Church sent new analyses, and Mr. W. Topley, F.G.S., of the Survey, contributed maps and notes on "Soils suitable for Potatoes geologically considered."

In "Meteorology as affecting Disease," Mr. J. G. Symons, F.R.S., exhibited rainfall maps showing coincidence with special disease years. The next section, "Historic literature of the potato," was in charge of Mr. W. S. Mitchell, M.A., and by the help of dealers in old books, and of private collectors, the list he had drawn up had but one gap—a Monardes. Such a collection has no before been brought together. The section "Maps showing the knowledge of the New World at the time of Elizabeth"