

shrubs." A female was procured breeding: the nest, made of grass, was pendent from the branches of a small bush; she alone was the architect, both carrying and weaving the materials; the male was not observed to assist in any way.

October 6, 1842.

XXXI.—*Extracts from a Report on subjects connected with Afghanistan.* By Dr. GRIFFITH, F.L.S.\*

*General Nature of Afghan Vegetation.*

BEFORE entering on a few brief notices of those vegetable productions which are not cultivated, but which administer to the wants of the people, it may be as well to premise a few popular remarks on the general nature of the Afghan vegetation. No parallel can be drawn between the Afghan flora and that of India in any part; for even in the lower parts of the country, but very little elevated above the general level of our extreme N.W. provinces, the flora of Afghanistan is decidedly peculiar.

The transition commences, as may be said, along the Sutleje: on the Ferozepoor route it is gradual, on that of Shikarpore it is much more abrupt. At Peshawur, which is in north latitude  $34^{\circ}$ , and about 1200 feet above the sea, it is tolerably mature; still there is an intermingling of Indian species, and this continues, gradually becoming less, until one ascends to Gundamuk.

In Kutch Gundava the Indian forms are less frequent; indeed it may be said that by the Ferozepoor route the Indian species encroach on the Afghan territory; in Kutch Gundava the Afghan species encroach on the Indian territory.

The Afghan transitional forms are various: *Boragineæ*, *Reseda*, *Chenopodiæ*, *Bertholletia*, *Farselia*, *Medicago*, *Buto-mus*, *Peganum Harmali*, *Nerium Oleander*, *Alhagi Marorum*? The Indian transitional forms consist of *Calotropis procera*, certain *Amaranthaceæ* and *Chenopodiæ*, certain *Saccharineous* and *Paniceous* grasses, *Acacia*, *Arabica* and *pudica*, *Prosopis spicigera* and *Dalbergia Sissoo*.

To gain a just idea of the Afghan flora, we must compare it with that of the Levant, and perhaps with the greater part of the basin of the Mediterranean, with which it may be said to correspond in latitude. With the general flora of Persia it may be regarded as continuous.

Few things can be more striking or worthy of comprehensive investigation than this vast extent of the Mediterranean

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or Australo-European botanical province. Dr. Falconer told me, that he had ascertained it to prevail a long way to the northward and eastward of Afghanistan; and I have materials for showing that it characterizes the country on the N. face of the Paropamisus, between Maimuna and Bamean; and from the mission of Meyendorff to Bokhara, to which my attention was directed by Sir A. Burnes, it is evident that it equally characterizes Bokhara, and the country between it and Orenburgh.

On this subject I shall enter into details in the purely botanical part of my report, which I shall have the honour of submitting with the arranged collection.

The striking features of the flora, as compared with India, are the scarcity, generally amounting to absolute want, of indigenous trees; a general poverty in variety of form; the general prevalence of forms characteristic of Southern Europe; the abundance of the large European families, such as cruciferous, umbelliferous, &c. plants, and of those forms of *Compositæ* known to botanists as *Cynarocephaliæ*, and of which thistles may be mentioned as familiar instances; the common occurrence of bulbous monocotyledonous plants, such as tulips, hyacinths, onions, &c.; the nature of its grasses, and the scarcity of *Orchideæ* and Ferns, which may be said to exist only in Eastern Afghanistan.

The number of aromatic plants, the prevalence of thorny species, and the very general occurrence of the flowering periods in the spring months, are also deserving of notice.

From almost all the forms being what are called European, it follows that no transition in form occurs consequent on variation of elevation, similar to that which has been so much noticed by all travellers in the Himalayas and other high Indian ranges. In this we are accustomed to associate height with the appearance of forms familiar to our earlier days. In Afghanistan it is not so, and it is remarkable enough that even the summer floras of its lowest parts, which have as high a mean summer temperature perhaps as any in the world, are still characterized by a majority of European forms. In high or in low, in hot or in cold situations throughout Afghanistan, forms characteristic of an European climate will be found to prevail. The traveller may pluck roses, pinks, hyacinths, sea-lavenders, kochias, eryngos, catchflies, flags, &c. at an elevation of 1000 feet, as well as of 10,000 feet. It would perhaps be difficult to find many generic forms characteristic of altitude.

Ordinary visitors would be likewise much struck with the circumstance, that a total change in the indigenous plants may



exist, while there is little or none in those cultivated. Thus at Cabul, where the winter is so severe, and where heavy snow lies for two or three months, and about which not an indigenous plant common to India perhaps is to be found, he will see Indian corn and rice cultivated with wheat and barley, rice perhaps forming the prevailing crop. We may see at Cabul the rice-fields bordered by poplars and willows, the aspen quivering over the nodding rice. This is easily accounted for: an approach to community of temperature may perhaps be found between the summer heat of Cabul and the winter and spring heats of the plains of India, which may explain the cultivation of wheat and barley. Between the summer heats of the two countries, there is likewise sufficient community to account for the cultivation of rice occurring in both in the summer.

*Brief notices on useful Plants occurring wild.*

The accompanying list will be found extremely meagre; but in the first place, the great bulk of the vegetation consists of the large European families, among which valuable products in the wild state are not extensively presented; and in the second, it is drawn up from memory chiefly, for even the casual overlooking of the herbarium, which is requisite to make it more complete, would delay one considerably in the forwarding of the report, and I may add, there is no probability of valuable information turning up to compensate for this.

Among monocotyledonous plants, that of the most use is, I think, the *maizurrye* of the Khyburs and Momunds. It is a small palm, and appears to be a *Chamærops*; perhaps the same as *C. humilis* of Southern Europe. Should it be distinct, I hope it may be allowed to bear the name of *C. Ritchiana*, after Dr. Ritchie, the only person who has explored the botanical productions of the Khybur Pass. This plant is extensively used in the manufacture of ropes or strings for the bottoms of charpaiees and of the sandals, so universally worn in the Momund and Khybur districts, and perhaps generally throughout lower Eastern Afghanistan.

Salep is to be found in the markets of Cabul, at a much lower price than in those of the N.W. of India. A species of *Orchis* is common in marshy places, high up among the Hazarah mountains, but I could not ascertain whether it was from this that Cabul was supplied. There is also an *Eulophia* in sand-islands of the Koonur river, from which salep may be derived.

Among the dicotyledonous plants, the umbelliferous family holds perhaps the highest rank, as affording valuable wild pro-



ducts. In Afghanistan, most of the foetid, or aromatic foetid gum resins, such as opoponax, assafoetida, ammoniacum, sagapenum, will probably be found. Of these the most important is the assafoetida, as it is largely exported, and consumed in the country as an adjunct to cookery. It was first announced as existing in the country, I believe, by Sir A. Burnes; it appears to be of general occurrence on the hilly tracts. Probably it is furnished by two species. At Metah, Capt. E. Conolly told me it was produced largely in the hot country of Seistan. He also informed me, that it was collected in conical pieces of paper, placed over a complete section of the plant, at the junction of stem and root.

As famous a plant as the assafoetida exists in the *Prangos pabularia*. In Afghanistan, however, it certainly does not merit the reputation which Mr. Moorcroft has recorded it possesses in some parts of Thibet. This plant is not uncommon on the Huzarah mountains, at an elevation of 9500 and 11,500 feet; but it is not used more, either as summer or winter fodder, than most of the plants possessed of any degree of succulence of the same districts. It is, as I have said, cut indiscriminately with thistles, docks, and a host of others, which would surprise an English farmer; this agrees generally with Dr. Falconer's experience.

The Maimunna, a Rhamnæous genus, is held in some esteem for its fruit, which for an uncultivated one is by no means unpleasant. It is common throughout the lower parts of Eastern Afghanistan; the fruit is a black berry of the size of a black currant, and of sweetish flavour. A much more esteemed fruit, which is sold commonly in the bazaars, is the *Goorgoora*, *Edgeworthia buxifolia*, Fal.: this plant was first found by Dr. Falconer about Peshawur, and by him was named after Mr. Edgeworth, a distinguished member of the Bengal Civil Service. Its natural characters are, as it were, intermediate between *Myrsinæ* and *Theophrasteæ*, tending likewise towards *Sapoteæ*. The fruit is roundish and succulent, about the size of a small marble; it is principally occupied by the seed, which is not eatable. I have not seen it fresh. It is considered heating by the Afghans, and this perhaps is the reason of its being common in the bazaars. The plant is generally a thorny shrub: it is common throughout the lower parts of the hills of Eastern Afghanistan.

The Sinjit, which is probably the *Elæagnus orientalis*, ought perhaps to have been enumerated among the cultivated fruit-trees; it is commonly planted along the banks of water-cuts, and is ornamental from its graceful crown and gray foliage.



The dried pulp of the berry is eaten, but it is much too sour for European taste.

The *Pistacia* occurs, Lieut. Sturt tells me, on the Hindoo Koosh, to a considerable extent; scattered plants of it are not uncommon throughout the mountainous parts of the country generally. It is a low tree; the seed constitutes the fruit, and is as much esteemed by the Afghans as almonds are by us.

Edible seeds, of a very pleasant flavour, slightly tinged with turpentine, are yielded by the *Chilghozeh*, a species of Pine; the seeds are, to all outward appearance, exactly like those of the Kunawur *Pinus Gerardiana*. They are eaten in considerable quantities, the supplies being derived from the Sofaid Koh.

Another wild fruit is yielded by the Umlook, a species of *Diospyros*; it also occurs in some gardens: it is not worthy of any notice.

One of the most celebrated plants in the country for its aromatic and stimulant properties is the Schnee, which may perhaps be a species of *Balsamodendron*. It occurs in the Kojuck range, and is to be met with, though not to such an extent, on most others.

Another famous plant is the Rhuwath, or Rhubarb, which, as it is also cultivated and in great request, ought to have been arranged with the vegetables. It is the only instance which evinces the knowledge of the Afghans of the value of etiolating or blanching certain plants. I have never seen it, not having been in Cabul in the spring. The wild plant, which I believe is the original of the cultivated one, is plentiful on the Kojuck range, and also on the Huzarah mountains up to an elevation of 11,500 feet. The leaves of this are used with others as winter fodder: the cultivated Rhubarb might easily be introduced into Simlah, Mussoorie and Darjeeling.

Several of the wild plants of Afghanistan are extensively used as fuel. Those in most common use about Cabul are species of *Artemisia* or wormwood, by some of our officers known as wild thyme; they are aromatic, camphorated, low shrubs, and some are eaten by camels. In the loftier districts great part of the vegetable fuel is furnished by the plants known generally by the name of Koollah-i-Huzarah, Huzarah's Cap. They form one of the most prominent features of the flora, occurring in dense, highly thorny, hemispherical tufts, as unpleasant to touch as the back of a hedgehog. Many species occur. To botanists they are known by the name of *Statice*.

Plants eaten by camels become, in such a barren country as



Afghanistan, invested with a good deal of importance. Generally such are not deficient; but one of the difficulties of the Bolan Pass is occasioned by their absence, and to a similar cause I attribute the great loss of camels on the return to India between Bookhak and Bala Bagh. Of these the most esteemed is the Ka-ri-Shootur, or Jaursa of the N.W., one of the most widely distributed plants occurring all over the N.W. of India, and all over Afghanistan, up to an elevation of 9500 feet. This plant is also known as affording the Turunjubeen, a sort of manna-like substance; the production of this appears to be local, and the only place I was told it was procured in Afghanistan was the Candahar district.

Perhaps the best other kinds of camel fodder are furnished by the *Chenopodeæ*, or Goose-foot tribe; these abound throughout the country, and are succulent and saline.

There is every probability of the true *Tragacanth* plants being found in the country, the section being one of the most common forms of *Leguminosæ*.

A species of *Daphne* not unlike *D. Cannabina*, the paper-plant of Nepal and Bootan, is not uncommon at elevations of 5000 to 6500 feet. The Afghans only make use of it in the construction of the matches for their match-locks.

Of the timber-trees of Eastern Afghanistan an extensive use is not made; the Baloot suffers most from being most accessible. The Zaitoon wood is remarkably heavy, sinking in water: it has a very close grain, and may be found to possess valuable properties. On the subject of forest-trees I have entered elsewhere.

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Since the above has been in type, we have received from our friend the Rev. M. J. Berkeley the following interesting extract from a letter of Dr. W. Griffith to Nees v. Esenbeck.

“Serampore, Oct. 11, 1841.

“I returned some months since from the country west of the Indus, whither I had accompanied the army during its campaign, and where I have been employed as naturalist a year after its departure. I have brought with me from 1700 to 1800 species of plants, besides a considerable collection of mammalia, birds, and fishes, of which the latter are now in course of being prepared for the Directors of the East India Company.

“The natural productions of Afghanistan are very different from those of British India, and approach much more nearly to those of the Levant, or more especially of those countries



which form the basin of the Mediterranean. With exception of the boundary line, which may be considered as identical with the course of the Indus, a mixture of forms occurs nowhere. *Gramineæ*, *Smilacinae*, *Labiatae*, *Boragineæ*, *Synanthérées*, *Leguminosæ*, *Cruciferae*, *Chenopodiaceæ*, are the prevailing families, as well in number of species as individuals. Beginning from the Monocotyledons I have numbered my collection to the *Labiatae* inclusive, and find so far 510 species, of which 250 are *Glumaceæ*, which is certainly a very high proportion. The great number of *Staticeæ*, most of which are very thorny, is another peculiarity of this flora.

"I intend on my return to England, which I expect will be certainly in two or three years, to publish not only these but the results of my other missions, and I should be glad if you would make known my intention on the continent.

"I feel confident that botanists will place me in a condition to work up, in accordance with the prospectus sent to you some months since, the materials which I have made such exertions to collect, and I hope that I shall bring to England matter for the work, not inferior even to that which, according to the latest information, has been amassed for the flora of Brazil. I shall with pleasure place at the disposal of those botanists who are engaged on monographs, or willing to undertake them, the whole of such parts of my collection as may be requisite; every notification however before my return must be necessarily imperfect, as the geographical relations of each species are known only to myself, and must be regarded as premature.

"I have just finished an essay on *Santalum*, *Osyris* and *Loranthus*. As regards *Santalum* there is much additional matter. *Osyris* is extremely remarkable: it has an embryo-sac analogous to that of *Santalum*, but the albumen and the embryo are formed exterior to it, and it enters not further into the composition of the seed. In *Loranthus* the embryo seems to me to be formed from the end of the pollen-tube, altogether without the intervention of an embryonic nucleus (Eychens).

"All my observations confirm the views of Schleiden, with the exception of the inversion of the embryo-sac by the pollen-tube, and *Loranthus* very especially favours his doctrine.

"I set out shortly for Malacca and remain there till my return to Europe. This is a new and rich field, and the climate is excellent."—*Linnæa*, vol. xvi. p. 286.





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