

CHAPTER IV.

REMARKS ON THE GEOLOGICAL AND BOTANICAL RELATIONS OF THE ENVIRONS OF WILDBAD.

THE chain of the Black Forest, extending along the volcanic line between the volcanoes of Italy and those of the Rhine, very probably owes its origin to those revolutions of our globe, which raised also the intermediary chain of the Swiss alps. In the measure however as the distance increased from the central point of commotion, the effects of the plutonic powers pronounced themselves in a minor degree. Thus it may be explained that, while the southern portion of the Black Forest almost entirely consists of primitive rocks, such as granite and gneiss, these gradually disappear as we advance in a northern direction, and at last are, with a few exceptions, overtopped everywhere by rocks of the secondary formation, such as the variegated and lower red sandstone. Of these all the neighbouring heights consist as far as Pforzheim, where the shelly limestone appears, forming the northern boundary line of the Black Forest. In the east, west and south of Wildbad the variegated sandstone also predominates, up to the highest points of the neighbourhood, and huge blocks of this rock peeled off like eggshells from their original position, by plutonic forces, are scattered over all the plateaus of this

district. To these very likely belongs the *giant-stone* near Wildbad, mentioned in a preceding chapter. The variegated sandstone of the Black Forest contains no traces of calcareous matter, but a high proportion of silicia enters into its composition, as well as some oxide of iron, which gives to it the red, porphyre-like appearance. Owing to this cause it is excellently well adapted for building purposes, it being not decomposed by contact with the outer air. Its extreme durability is proved by the Strassburg cathedral, which is entirely built of variegated sandstone, and whose aspect is still the same it was, when left by the stone-mason. The bath-buildings of Wildbad, and all the principal edifices of the town, are also constructed of this sandstone.

The granite rock, as already stated, is but rarely met with in the northern parts of the Black Forest. It only appears in the valley of the Murg, near Reichenbach and Schwarzenberg; from Enzklösterle to Wildbad, in the valley of the Enz; and near Herrenalb, where it forms an aggregate of high peaks, resembling towers constructed by the hand of man, which are called the *Falkensteine* or hawk's stones.

At Liebenzell also a granite-gang may be perceived, wedged in between the variegated sandstone, in an elevation of 995 Par. F. above the sea-level. Considering these instances of the appearance of granite rocks under a balneographical point of view, we at once perceive, that it gives origin to all the warm springs of the district, and this fact becomes the more remarkable, if we know that in the *Gais-thal* near Herrenalb, in a spot almost touching a line drawn from Wildbad to Baden-Baden, a thermal spring has been discovered some years ago. These observations will lead us to infer, that there exists probably a subterraneous con-

nexion between the hot springs of Wildbad and Baden-Baden, while at the same time they are bearing evidence to the truth of the remark, that the hot springs always rise from rocks of the primary formation, the cold sources generally having their origin in transition-rocks. To the latter point the circumstance of the Teinach-springs, rising from the red sandstone, lends additional weight.

The distribution of the waters of the Black Forest is highly interesting, and, as it appears, in direct opposition to all laws of hydrostatics; for, contrary to the observations made in other parts of the globe; the largest accumulations of water occur exactly on the highest elevations, instead of existing in the valleys, where their natural place should be. The most remarkable of the mountain-lakes of the Black Forest have already been enumerated in the introductory chapter of this volume, together with their elevation above the level of the sea; there exists however a great number of smaller ones, all of them in great altitudes, which for want of space have not been mentioned; and many peat-mosses of those high elevations most certainly have formerly been the beds of lakes.—Moreover, there is no lack of evidence to the fact: that in ancient times there were enormous lakes in various parts of the Black Forest, whose waters, after having broken their bounds, took their egress towards the Rhine and the lesser valleys of the neighbourhood, destroying every thing before them, and piling up those gigantic accumulations of fragments of rocks, which abound chiefly in the southern portion of this mountainous district. Such an accident, though on a smaller scale has also taken place in the Enz-valley, which still shows the traces of devastation by water, near the *Sprollenhöfe*. There considerable accumulations of granite and sandstone-fragments appear, produced undoubtedly by the force of waters rushing down

through the *Kegel-* or Millbrook-vale, which extends from Kaltenbrunn to the valley of the Enz. These accumulations continue till to the embouchure into the Enz-valley, the sole of which is covered with them to such an extent as to cause a deviation in the course of the river. Another aggregate of stone-fragments, by which the bottom of the valley is covered till down to the *Lautenhof*, occurs at the mouth of the Rollwasser-Tobel.

The rock prevalent near Wildbad, is a gross-grained granite, composed of smoke-coloured quartz, yellowish feldspar, and silver white mica; in this shape it appears particularly at the silver-wear (*Silberwehr*). Beyond Wildbad a compact, small-grained sandstone, of an ashy hue, enters almost imperceptibly into the composition of the rock, and at the same time the particles of feldspar and quartz increasing in size, often appear in a cristalline shape. In the upper portion of the Enz valley flesh colored *Albite*, in pieces of several cubic inches, becomes the principal constituent of the granite, in lieu of the common feldspar. There also the rhombs of mica are of more than a square inch in circumference.

The granite rocks near the *Sprollenmühle* contain a mineral found nowhere else in these parts, called Leptinite (*Weissstein*); it consists of a homogeneous mass of blueish grey feldspar, with quartz, mica and cœrulean cyanite. — The stone pedestal of the Schiller statue at Stuttgart consists of granite quarried near the *Kälbermühle*, in the neighbourhood of Wildbad. Some years ago, blue colored granite was discovered in the site of the *Neue Badgebäude* at Wildbad, when the rocks around it were blasted in order to obtain the extent of level ground, necessary for the construction of this building.

Professor Sigwart, who submitted the granite of Wildbad

to dry distillation, found in it carbonate of ammonia. The arable soil of this district is of a reddish hue and chiefly consists of sand. Professor Schübler who analysed it chemically, found in a hundred parts of it:

Quartz sand	77,0
Clay, with traces of oxide of iron . .	20,1
Carbonate of lime	1,3
Humus (Ulmine), extractive with potash	0,1
Substances volatilized by red heat . .	1,2
	99,7

One cubic inch of it, in a dry state, weighed 454 grains, when moistened the weight increased to 622 grains. Its consistency, when dry, was but 6,8, — clay being taken as a standard, = 100. From these dates it must become evident that this soil is extremely light; however fine firs, and, along the slopes of the hills, excellent rye is grown on it.

The most remarkable minerals found in the neighbourhood, are the following:

Fluorspar, crist.; in the variegated sandstone near Neuenbürg.

Bituminous quartz (*Stinkquartz*); var. sandst., near Calmbach.

Horny quartz (*Hornstein*); granite; Wildbad.

Silicious fieldspar (*Albite*); gran.; Wildbad.

Oxide of manganese (*Pyrolusite*), crist.,

Manganite,

Wad (*Brauneisenrahm*),

Red iron ore (*Rotheisenoeker*),

Lepidokrokite,

Brown iron ore (fibrous and compact *Brauneisenstein*),

Carbonate of iron, (*Eisenspath*), crist.; in the clayey sandstone near Neuenbürg;

Green carbonate of copper (*Dichter Malachit*, and *Eisenschüssiges Kupfergrün*); clayey sandst.; Bulach; Azure copper ore (*Kupferlasur*), crist.; silicious sandstone; Bulach.

Grey copper (*Fahlerz*), crist; cl. sandst.; Bulach.

The elevation above the sea-level, of the principal points around Wildbad, given below, in Paris feet, will assist the visitor in obtaining a correct image of the geological formation of this district.

Hornisgründe, 3612; *Hohlohkopf*, 3280; *Rossbühl*, 3016; *Kaltenbronn*, 2645; *Wild lake*, 2817; source of *Enz*, 2354; *Enz* at *Enzklösterle*, 1802; level of the *Enz* at *Wildbad*, 1323; — at *Neuenbürg*, 961; — at *Pforzheim*, 761; *Dobel*, 2230; plateau between the valleys of the *Enz* and the *Nagold*, at *Bruderhof*, 1953; *Neu-Bulach*, 1833; *Teinach*, 1212; *Zavelstein*, 1800; *Calw*, level of the *Nagold*, 1036; *Liebenzell*, l. of *N.*, 984; *Freudenstadt*, 2268. — The names printed in italics, are those of the heights affording the finest prospects.

The botanical features of the environs of Wildbad are those of the Black Forest in general; the cryptogamous plants appear in great numbers, and amongst the phaenogamous those peculiar to the transition-limits of the sub-alpine region predominate. The english botanist will find here a rich harvest of the former, in fact, six times the number of cryptogamous species observed in England, are met with in this country, where 44 species of ferns, 240 mosses, 219 lichens, 52 alges, and 415 fungous plants are indigenous. The following details, merely intended to assist the botanist in his excursions, have no claims to a perfection, which years of laborious research only can attain; if therefore any one who peruses the present volume, should be fortunate enough to meet with species not enu-

merated here, the author would be happy to receive communications addressed to Mr. Sonnewald, the publisher.

An almost uninterrupted succession of fir- and pine forests covers the reddish sandstone heights of these mountains. The red fir is predominant in the higher regions, while farther down the silver fir becomes more conspicuous. The shady ground of these woods presents the aspect of a soft mossy quilt, interwoven with beautiful ferns, of which the most remarkable are: *Aspidium spinulosum*, *Lonchitis*, *Oreopteris*, *Filix mas.* and *Filix foemina*, *fragile*, *aculeatum*, and *anthricifolium*; *Polypodium phegopteris*, *thelypteris*, *oreopteris*, *dryopteris*, and *dilatatum*; *Blechnum boreale*; and *Osmunda regalis*. All the prominent rocks left free from moss, are clothed with *Isidium corallinum*, and *Byssus* (*Chroolepus Jolithus*), while those most exposed to the northwinds are overgrown with an array of grey or black coloured lichens, commonly considered as the sole property of the Flora of the scandinavian provinces. Of these the rarest are: *Parmelia fahlunensis*, *stygia*, and *excausta*; *Gyrophora glabra*, *proboscidea*, *cylindrica*, *erosa*, *deusta*, *pustulata*; *Cornicularia pubescens*; *Stercocaulon paschale*. The scarcest species of this order however are nourished by the bark of the forest trees;—the milk coloured *Thelotrema* (*Thelotrema lepadinum*); *Sphaerophoron coralloides*, and *fragile*; also common liverwort (*Sticta pulmonacea*), *Lecidea sanguinaria*; and numerous *Parmeliae*. In the highest regions, finally, broad, greyish-green bands are seen between the dark leaves, they mostly are of the species: *Alectoria jubata* and *sarmentosa*; *Borreria ciliaris*, *furfuracea*; and *Usnea florida*, and *barbata*;—sickly trees here are overspun with the long threads of *Usnea longissima*, and decayed stems serve as abode to peculiar formations, like *Buxbaumia aphylla*, and *Lecidea comadophila*.

As has been said in the geological part of this chapter, the Black Forest presents the strange phenomenon that the summit of its mountains is the part most impregnated with moisture, the valleys being generally dry and but irrigated so far as necessary. There the meadows are clothed with a beautiful carpet of gramineæ and flowers, embalmed by *Meum athamanticum* and caraway (*Carum carvi*), there you find dry gravel walks, and clear brooks, rushing over granite and sandstone rocks: as one ascends to their sources however, the moss-veil becomes denser, the trees decrease in size, till at last the dwarf-pine (*pinus montana*) appears, attaining to scarcely man's height, and rarely scattered over the surface of a peat-moss, or the banks of a dead brown lake.

These turf-lakes are entirely devoid of such aquatic plants as require warmth, yet on the other hand their accesses are covered with a fine, smooth carpet of sea-green sphagnum, interlaced with the roseate blossoms of the cranberry (*Vaccinium oxycoccus*), rosemary, (*Andromeda polifolia*), the purple, rose like leaf-bunches of sun-dew (*Drosera rotundifolia* and *longifolia*), and the black *Empetrum*. The seams of these carpets, towards the forest, consist of a thick sod composed of dwarf-rushes (*Scirpus cespitosus*); *Juncus squarrosus*; and of *Nardus stricta*, the sure indicator of a sterile soil. — Such a lake is the Wild-lake near Wildbad.

The subjoined list will present a tolerably correct picture of the indigenous Flora of Wildbad; and in order to facilitate research, the stand of the plants named, has been given wherever it appeared necessary. The classification is that of the Linnean system.

Pinguicula vulgaris.

Circæa alpina. (*Enzklösterle,*
Calmbach.)

Valeriana tripteris.

Crocus vernus (*Zavelstein*).

Scirpus cespitosus.

Eriophorum vaginatum (*Wildlake*).

— *latifolium*.

Nardus stricta.

Aira cespitosa.

— *flexuosa*.

Festuca nemorum (*Enzklösterle*).

Festuca sylvatica VILL. (*Herrenalb*).

Montia rivularis.

Scabiosa sylvatica.

Galium rotundifolium (above *Herrenalb*).

Galium saxatile.

Majanthemum bifolium.

Ilex aquifolium.

Lycopsis arvensis (*Teinach*).

Lysimachia nemorum (*Kälbermühle*).

Gentiana lutea (*Hohlohkopf*).

Menyanthes trifoliata (*Wildlake*).

Atropa Belladonna.

Phyteuma spicatum.

— *orbiculare*.

Jasione montana.

Lonicera nigra.

Viola palustris.

Hedera helix.

Heracleum elegans.

Myrrhis hirsuta (*Calw*).

— *aurea* (*Bulach*).

Chaerophyllum silvestre.

Staphylea pinnata.

Sambucus nigra.

— *racemosa*.

Drosera rotundifolia.

— *longifolia* (*Eiberg* near *Calmbach*).

Galanthus nivalis.

Muscari comosum (*Calw*).

Convallaria verticillata.

Luzula maxima.

Juncus squarrosus.

Erica vulgaris.

Vaccinium myrtillus.

— *uliginosum*.

— *vitis idæa*.

— *oxycoccos*.

Epilobium angustifolium.

Acer platanoides.

— *pseudo-platanus*.

Paris quadrifolia (*Promenade*).

Andromeda polyfolia (*Wildlake*).

Pyrola rotundifolia.

— *rosea* (on the road to *Neuenbürg*).

Monotropa hypopitys.

Chrysosplenium alternifolium.

— *oppositifolium*.

Silene linicola (*Teinach*).

Stellaria nemorum.

— *uliginosa*.

— *media*.

- Arenaria rubra** (*Dobel*).
Spergula arvensis.
Cerastium viscosum.
Oxalis acetosella.
Sedum telephium.
Euphorbia amygdaloides.
Sorbus aria.
Rubus glandulosus.
 — *idæus*.
 — *saxatilis*.
Fragaria vesca.
Potentilla argentea (*Calw*).
Comarum palustre.
Hypericum humifusum.
 — *pulchrum* (*Teinach*).
Ranunculus auricomus.
 — *platanifolius*.
 — *fluviatilis*.
 — *lanuginosus* (*Dobel*).
 — *ficaria*.
Trollius europæus.
Anemone nemorosa.
Nepeta cataria (*Calw*).
Melampyrum pratense (*Enzklösterle*).
Melamp. sylvaticum (*Dobel*).
Digitalis purpurea.
Geranium phæum.
Fumaria Vaillantii (*Teinach*).
Corydalis fabacea (*Hirsau*).
Polygala depressa (*Enzklösterle*).
Genista pilosa.
- Genista germanica**.
Spartium scoparium.
Hieracium paludosum (*Dobel*).
Adenostyles albifrons (*Wildlake*).
Helichryson lut.-album (*Calw*).
Senecio nemorensis (*Wildlake*).
Senecio sylvaticus.
Arnica montana.
Orchis morio.
 — *palustris* (*Dobel*).
 — *coriophora* (*Dobel*).
 — *militaris*.
 — *maculata*.
Neottia ovata (*Calw*).
Epipactis latifolia (*Calw*).
Carex vulpina.
 — *canescens* (*Wildlake*).
 — *leucoglossum* (*Wildlake*).
 — *glauca*.
Betula pubescens.
Carpinus betulus (*Promenade*).
Fagus sylvatica.
Castanea vesca (*Loffenau*).
Quercus robur.
 — *pedunculata*.
Corylus avellana.
Pinus montana.
 — *sylvestris*.
 — *abies*.
 — *picea*.

<i>Pinus strobus</i> (<i>Promenade</i>).	<i>Encalypta vulgaris</i> .
<i>Salix cinerea</i> .	<i>Lycopodium annotinum</i> .
— <i>fragilis</i> .	— <i>clavatum</i> .
— <i>aurita</i> .	— <i>selago</i> .
— <i>parvifolia</i> .	— <i>complanatum</i> .
<i>Empetrum nigrum</i> .	<i>Trichostomum pulvinatum</i> .
<i>Polypodium dilatatum</i> .	— <i>canescens</i> .
— <i>vulgare</i> .	— <i>heterostychum</i> .
— <i>dryopteris</i> .	— <i>aciculare</i> .
— <i>phegopteris</i> .	<i>Grimmia apocarpa</i> .
— <i>thelypteris</i> .	<i>Dicranum viridulum</i> .
— <i>oreopteris</i> .	— <i>glaucum</i> .
<i>Aspidium fragile</i> .	— <i>heteromallum</i> .
— <i>anthriscifolium</i> .	— <i>purpureum</i> .
— <i>aculeatum</i> .	— <i>Schraderi</i> .
<i>Asplenium viride</i> .	<i>Barbula muralis</i> .
— <i>septentrionale</i> .	— <i>unguiculata</i> .
— <i>trichomanoides</i> .	<i>Syntrichia muralis</i> .
— <i>germanicum</i> .	<i>Polytrichum juniperifolium</i> .
— <i>ruta muraria</i> .	— <i>juccæfolium</i> .
<i>Pteris aquilina</i> .	— <i>urnigerum</i> .
<i>Blechnum boreale</i> (<i>Carlsburg</i>).	— <i>aloides</i> .
<i>Doradilla septentrionalis</i> .	— <i>nanum</i> .
<i>Osmunda regalis</i> .	<i>Arthotrichum anomalum</i> .
<i>Equisetum palustre</i> .	— <i>striatum</i> .
<i>Sphagnum obtusifolium</i> .	<i>Neckera ulophylla</i> .
— <i>acutifolium</i> .	— <i>crispa</i> .
— <i>cuspidatum</i> .	<i>Lesca sericea</i> .
<i>Gymnostomum Hedwigia</i> .	— <i>complanata</i> .
— <i>ovatum</i> .	<i>Climachium dendroides</i> .
— <i>truncatum</i> .	<i>Bartramia crispa</i> .
— <i>pyriforme</i> .	<i>Hypnum argenteum</i> .
<i>Tetraphis pellucida</i> .	— <i>vespiticium</i> .

Hypnum serpens.	Leucanora tartarea.
— alopecurum.	Parmelia stygia.
— myosuroides.	— physodes.
— velutinum.	Cetraria islandica.
— purum.	Lecidea lapicida.
— ^{V.} _{dec.} rutabulum.	— sulphurea.
— riparioides.	Gyrophora proboscoides.
— abietinum.	— pustulata.
— tamariscinum.	Borrera ciliaris.
— cuspidatum.	— purpuracea.
— Schreberi.	Peltidea polydactyla.
— lucens.	— canina.
— triquetrum.	Evernia prunastri.
— rugosum.	Cenomyce pyxidata.
— christa castrensis.	— furcata.
— cupressiforme.	— rangiferina.
Marchantia stellata.	Sphærophoron coralloides.
— conica.	— fragile.
— hemisphærica.	Alectoria jubata.
— polymorpha.	Rumalina fraxinea.
Jungermannia platyphylla.	— farinacea.
— tamariscifolia.	Usnea florida.
— tomentella.	— barbata.
— complanata.	— longissima.
— polyanthos.	Collema rivulare.
— epiphylla.	Lepraria cinereo-sulphurea.
Sticta pulmonacea.	