

by a little garden has been quaintly built to the top of it. The wonder is, that these rocks, all different from the hill, which is of secondary formation, must have been brought from some of the central parts of the Alpine range, many miles off. I afterwards visited the better-known kindred phenomenon on the face of the Jura hills above Neufchatel, where, amidst many lesser granite blocks, there occurs a huge one well known under the name of the Pierre-a-Bot (said to measure seventy feet in one direction); but though the wonder of the transportation of these stones from the same original seat is increased by the greater distance (seventy miles as the crow flies), they form a spectacle much less impressive than the Blocks of Monthey. Both sets of objects, however, play an important part in one of the boldest theories of modern science.

It is now about a dozen years since attention was attracted by M. Venetz, and other Swiss savans, to certain appearances which seemed to indicate an extension of glaciers in ancient times far beyond what has here been described. Some miles down the valley of the Arve from Chamouni, near Servoz, the most careless traveller might be struck by the smoothed state of the rocks by the wayside, as if some mechanical agent had passed over them in the direction of the valley, and worn down every inequality. It is scarcely less surprising, high up above the Mer de Glace, to observe the smooth faces of the precipices, and also to detect remnants of ancient moraines resting on the mountain-side, as if the glacier had once risen to five times its present ordinary height. Such markings are seen in many parts of Switzerland, where glaciers do not exist. They are also traceable in our own country; for example, in the valley of Llanberis in Wales. In that case it is impossible to doubt that glaciers had once descended from the skirts of Snowdon, and, pressing through this valley, had polished off every inequality up to a certain height. This is a very curious fact, as it cannot be accounted for without supposing some great though temporary reduction of temperature at the time when the appearances were produced; and the question arises, If there were such a reduction of temperature, how would it affect life in the regions where it prevailed? Some geologists, headed by M. Agassiz, have gone beyond all common bounds in theorising on this subject. Agassiz himself started the idea, that permanent ice once covered the northern hemisphere down to a low latitude, and was thus the cause of the distribution of loose blocks over the north of Europe. It was, according to his followers, a period of universal death, not long antecedent to the appearance of man on the earth, and connected with the remarkable absence of fossils from what is called the Blue Clay or Diluvium. It has been thought by others besides the Neufchatel professor, that at least the Alpine ice once extended to the Jura range, and was thus the means of carrying granite blocks from the central mountains, and depositing them on that range, and likewise on the hill above Monthey, such blocks being held to be, in fact, remnants of ancient moraines. In 1840, M. Agassiz and Dr. Buckland, in a tour through Scotland, thought they beheld ancient moraines at the mouth of every little side valley which they chanced to pass, and they hesitated not to account for the terraces of Glenroy by supposing two glaciers to have once dammed up the adjacent valleys so as to form a lake. It is only of late that we have begun to recover from the astonishment excited by the first burst of these theories, and to see that they rest on very insufficient bases.

In the first place, the idea of a circumpolar glacier constantly expanding outwards and carrying debris to low latitudes, is put an end to by Professor Forbes's discovery, that ice does not move by dilatation, as M. Agassiz had assumed. Then, as to even the limited hypothesis, that glaciers proceeded from the central chains of the Alps to the flanks of the Jura, carrying hither huge blocks, it has never yet been shown how they could proceed in such a course, with no sufficient slope to produce their movement, and with lines of hills intervening to obstruct it. Assuredly ice is never seen to move in such circumstances at the present day. The idea of Mr. Forbes, that a glacier came down the valley of the Rhone, makes a less demand on our credulity, and some circumstances might be adduced in support of it. For instance, above St. Maurice, I found faces of rock at the bottom of the hills on the south side smoothed exactly like those of Llanberis. At the narrow gorge at St. Maurice, where these smoothings might, if anywhere, have been expected, they are not to be seen; but a low hill, occupying the middle of the valley immediately below this gorge (between St. Maurice and Bex), is smoothed on many parts of the surface, as if a glacier had passed over it. I nevertheless deem it a violent hypothesis to suppose that any glacier could be of such volume as to fill up the Rhone valley to a point between two and three hundred feet above the site of Monthey—a point perhaps not less than a thousand feet above the rocky bottom of the trough of the valley, and this at a place where the whole space is several miles wide. A glacier, to fill such a space, and to such a depth, must have been enormous beyond all credulity.

It seems much more likely that the usual theory of transported blocks—namely, that they have been carried by icebergs upon the seas formerly intervening between their native seat and the places of their ultimate deposition—is the true explanation of the marvel-

lous erratics of Monthey and Neufchatel. As far as I am aware, evidences of the former presence of the sea at high levels have not as yet been sought for in the Alps; yet, if they were, they would not be difficult to find. I was particularly struck by the alluvial terraces at Vevay, above the Lake of Geneva, only a few hours' journey from Monthey. They have been spoken of as moraines, which they do not in the least resemble. They are undoubtedly the remnants of sloping sheets of common river detritus, deposited by the little river of Vevay in the sea when it stood at different relative levels from the present, and which had been afterwards cut through by the river when the relative level was lowered. The highest of these terraces which I measured (and there are traces of others somewhat higher) was fully 442 feet above the lake, which is the same as 1670 feet above the present level of the sea. Now this is just about the elevation which I would assign to the Monthey blocks; so that beyond all question we have evidence of the former existence in the Rhone valley of a body of water at about the height required in order to float these blocks to their present situation. When the water stood at this height, an estuary would penetrate pretty far up into the valley. The glaciers might come sufficiently far down to send off masses into this firth, bearing the usual charge of blocks from the central heights. As these passed along towards the open sea, they would be extremely apt to land upon the Monthey hill, which projects so remarkably into the valley. Such may be the true history of the deposition of the Monthey block.

For some additional evidence to the same effect, I may advert to a curious study in physical geography presented in the Bernese Alps. The Lake of Lungern—occupying the upper part of a valley between Lucerne and Interlaken—has been in recent time reduced upwards of two hundred feet in height, for the sake of the land on which it stood; and thus have an opportunity of observing certain natural arrangements connected with such bodies of water. As often happens, the chief inlets of water into this lake were at its upper extremity.—There two or three rills descending through rough passages in the hills joined it, each bringing a *talus* of stony debris, over which it had in ordinary times passed by a slightly-hollowed channel on its way to the lake.—Now that the waters have been lowered, we can see the terminations of these *tali* coming to a sudden stoop, a little way within the line of the ancient shore, showing that it is not the tendency of such formations to spread equally out under the water. But what is more curious, the streams, in consequence of the withdrawal of the water which had received them, have cut down through the *tali*, and now pass on to the abridged lake through little valleys, with a terrace on each side; no longer able to effect the surfaces of these formations, which were originally their own work. This is a result which appears to depend on the force which running water exercises on the fore-edge of any formation over which it falls. Each of these little rills, on being no longer quietly received into the lake, had begun to tumble over the sloping face of the now dry *talus*, gradually cutting it down and backwards, as the St. Lawrence wears the rocks at Niagara. From this single observation, I read off the interpretation of all such ancient alluvia as those which have been mentioned as skirting the immediate banks of the Arve between Geneva and Sallenches.—They were once, in the form of an entire sheet of alluvium, the bed of the river. This alluvium would have continued in its original form for ever, had the dynamics of the river not undergone a change which could only happen in consequence of the withdrawal of some recipient body of water, when at length the stream would begin to cut down its bed. The terraces of the Arve valley are thus a proof that the Arve was once received directly by some body of water, most probably the sea, instead of, as now, flowing into the Rhone.—Such is but an example of objects seen in many other valleys, and which have generally had the same history; † memorials they for the most part are of the former presence of the ocean at a relative level above the present. Such proofs in the case of the Arve have the peculiar value of serving as additional evidence that the sea once rose in the Rhone valley to the height of the Monthey blocks. The zone of boulders at Neufchatel is higher (said to be about 2500 feet above the sea); but the explanation, if established in the one case, will equally apply to the other.

It thus appears that, though there are appearances of change in the glacier world, there is no need to go beyond reasonable bounds in speculating upon the subject. The Glacial Theory, as it was called, had a brilliant run of a few years; but, like some fairy palace of that unstable material, it is now seen lying in a dismal state of ruin. The whole history of it may still serve a useful end, as a warning to men of science. Blocks are seen in singular situations—we know of no vehicles for

\* Monthey village is set down in Keller's map at 1350 French feet (1437 English feet) above the sea. If the blocks are 250 feet higher—and I should think the bulk of them about that height—they are scarcely above the elevation of the great terrace at Vevay. It may be remarked that Professor Forbes speaks of these blocks as possibly 500 feet above the village; but under the benefit of some recent experience in the study of heights, I feel convinced that this is much above the truth.

† There is a distinction to be drawn between these sloping alluvia and the horizontal terraces which are occasionally seen along the sides of valleys. The latter are to be considered as the result of a wearing of the sea on the hill-sides at their respective levels.

their transport but glaciers: *ergo*, glaciers, &c. Behold, however, another agent in time casts up, much more likely! Smoothings of rocks are seen in high situations; they resemble those effected by glaciers: *ergo*, once more glaciers! But by and by, it is shown that icebergs carried on the sea along rocky coasts will produce such smoothings,\* and there has even been found evidence that the smoothed rocks in certain districts are at the particular heights where the surface of the sea formerly was in those portions of the earth.† Alluvial masses and terraces are seen at the openings of the glens of Scotland and Ireland, and are at once pronounced to be identical with ancient moraines; therefore they form evidence for the glacial theory. Subsequent examination shows these subjects to be of a wholly different character, the detritus laid down by rivers in the sea. It would be almost cruel to dwell any longer on the rash assumptions hazarded on the most superficial observation at the first blast of this unfortunate theory. Let us hope that it will be long before another set of ingenious men go off upon so false a scent, or prepare for themselves such humiliating reverses.

More than fearing that I may have tired many of my readers, and yet hopeful that a few of these observations may assist in promoting the advance of an interesting science, I now bid adieu to Switzerland.

\* See a paper by M. Von Waltershausen, Edin. Philosoph. Journal, July 1848.

† See several examples adduced in "Ancient Sea-Margins, &c." 1848.

#### WOMAN'S DEVOTEDNESS TO MAN.

She is happy in owing everything to man. That alone imparts a singular charm to the poor household. There nothing is foreign or indifferent; every thing bears the stamp of a beloved hand, the seal of the heart. Man very often little knows the privation she endures, in order that on his return, he may find his dwelling modest, not adorned. Great is the ambition of the woman for her household, clothes, and linen. This article is new; the linen closet—the pride of the country woman—was unknown to the pride of the town workman before the revolution in industry which I have mentioned. Cleanliness, purity, modesty—those graces of woman—then enchanted the house; the bed was surrounded with curtains, the child's cradle dazzling with whiteness, became a paradise—the whole cut out and sewed in a few evenings. Add, moreover, a flower at the window! What a surprise! the husband, on his return, no longer knows his own home! This taste for flowers, which has spread (there are now several markets for them here,) and this little expenditure to ornament the interior, are they not lamentable, when these people never know whether they have any work on the morrow? Call it not expenditure, say rather economy. It is a very great one, if the innocent attraction of the wife renders the house charming to her husband, and can keep him there. Let us ornament, I beseech, both the house and wife! A few ells of printed cotton make her another woman; see, she is regenerated, and become young again.—*The people, by Michelet.*

#### SYMPATHY.

It is sweet to turn from the chilling and heartless world—the world that so often misjudges our motives—to seek in some sympathizing heart for consolation—to find congenial souls that can understand and appreciate the feelings which actuate us.

In sorrow, how consoling is the blessed voice of sympathy. In our greatest trials it lightens our burdens—making smoother our pathway before us, and pouring a healing balm into our hearts, and our lesser afflictions are forgotten. Blessings upon those kind souls who go through life with a cheerful glance, and kind words for the desponding—who are ever ready to extend the hand of friendship, and whisper words of consolation to those who fall out by the way. Though they may sometimes be deceived, yet they have faith in humanity; they believe no one is so degraded, but he has some germ of in-dwelling goodness, that the warm sunshine of kind sympathy may yet call forth the sweet, though perhaps wild flowers of truth and happiness.

#### MOTHER AND SON.

It seems the nature of sons to love their mothers—with a mixture of tenderness to the sex, gratitude for the innumerable cares paid to their infancy; fondness to the spring from whom all their little infant and boyish indulgence has flowed; and a pious reverence to gray-hairs and wrinkles of a closing life, the best years of which have been expended in their service. The love of the mother is the most universal and the most beautiful feature in the character of man, as to possess it is the crowning glory and supreme felicity of woman.

#### THE DIVINITY OF LOVE.

The affection with which the mere fact of helplessness and dependence fills the heart of a woman, is the divinest attribute of her nature. Is there a more lovely sight on earth than the devotion of a daughter to an aged, perhaps peevish parent, sinking into a second childhood; or a mother to that sickly deformed, and perhaps imbecile child, who is an offence and a burden to every one beside? It is beautiful! It is the Divinity.