

the mercury in the barometers, and the relation between the wind and the atmospheric pressure is such that the wind comes nearly at right angles (with tendency towards the place of deficiency) to the line joining the place of highest and the place of lowest barometer, the place of least pressure being on the left of the wind's course. This comprehensive law for the winds of the northern hemisphere (left having to be altered to right for the southern) was first proved to be generally applicable to all winds by Dr. Ballot, of Utrecht. The intermingling of polar and tropical winds causes condensation of vapour, and also electrical action. These processes set free sensible heat. On the other hand evaporation renders heat latent, and therefore causes chilliness. Heat thus rendered alternately latent and active is virtually a statical force, and must affect the dynamical condition of the air. Thus the moving force of wind must result from disturbed equilibrium of atmospheric pressure, from evaporation of water, condensation of vapour, electrical action; and besides the direct influence of solar heat, there may be other agents active beyond our earth, as the attraction of the sun, moon, &c., of which, however, nothing definite is known. The polar current when uppermost may produce a chilling effect, and cause the lower and warmer current to part with some of its moisture; and, where the tropical current is thrown into the higher and colder region of the atmosphere there rain must happen. Thunder storms are always the result of the conflict of two dissimilar currents of air. The contact may take place vertically, horizontally, or more or less so. When it occurs under the former circumstance, the progress of the storm marks very closely the advance of the predominant wind. Under the latter circumstances the battle cannot be charted down, and we are left to conjecture the state of affairs. The presence of the upper current is shown only by the motion and visible features of clouds, most notably so by the cirrus and cirro-cumulus. The necessity for the existence of opposing winds for the concurrence of thunder storms has been strangely overlooked, although it is recognised even in the Psalms:—"He causeth the vapours to ascend from the ends of the earth, He maketh lightnings for the rain, He bringeth the wind out of His treasures." Mr. Glashier, the veteran meteorologist, observed during a balloon ascent, made in the middle of January, a strong current of air from the south-west over our country, having a depth of nearly one mile. This tropical current continued many days. "The south-westerly current thus observed," says Mr. Glashier, "is of the highest importance, as bearing upon the very high mean temperature we experience during the winter, so much higher than is due to our position on the earth's surface; and it is highly probable that to its fluctuations the variations of our winters are due. . . . So long as these winds blow we have no frosts or intense colds; but the moment the wind changes during the winter to an easterly, north-easterly, or northerly direction, we have both frost and snow, and more or less intense cold. The south-west winds in their course meet with no obstruction in coming to us, but they blow directly to us and to Norway over the Atlantic; and hence we enjoy a much milder climate during winter than any other lands not similarly situated with regard to such winds."—*Mechanics' Magazine*.

ART.

Music cultivates the taste and refines and elevates the moral feelings.—TATE

Czerny's Letters to a Young Lady.

FIRST RUDIMENTS OF THE PIANO.

The first principles, namely, a knowledge of the keys and the notes, are the only really tedious and unpleasant points in learning music. When you have once conquered them, you will every day experience more and more amusement and delight in continuing your studies.

Consider the matter as if you were for a time compelled to wend your way among somewhat tangled and thorny bushes, in order to arrive at last at a charming prospect and a spot always blooming in vernal beauty.

The best remedy against this disagreeable necessity is, to endeavor to fix these preliminary subjects on your memory as firmly and quickly as possible. Such pupils as manifest, from the very outset, a desire and love for the thing, and who strongly and rationally apply their memories to the matter, will acquire a perfect knowledge of the keys and notes in a few weeks; while others, frightened at the apparent tediousness of the acquisition, often lose several months in attaining the same object. Which, then, of these two ways is the better?

Before any thing else, I earnestly entreat you to acquire a graceful

and appropriate position, when sitting at the piano-forte. The seat which you use must be just so high that the elbows, when hanging down freely, may be a very little less elevated than the upper surface of the keys; and if your feet should not reach the ground, have a dwarf stool, or ottoman, made of a proper height; upon which to place them. You must always seat yourself exactly facing the middle of the key-board, and at such a distance from it that the tips of the elbows may be a little nearer to the keys than the shoulders.

Equally important is a graceful position and carriage of the head and upper part of the chest; it must neither be stiff nor bent. Some of my former little pupils, whom I used to tease with the reproach of *making a cat's back*—that is, sitting with their backs bent and oblique—have, in later days, thanked me for the strictness which I showed in this particular.

It is not merely that an awkward position is disagreeable and ridiculous, but it also impedes, if not prevents, the development of a free and elegant style of playing.

The fore-part of the arm (from the elbows to the fingers) should form a perfectly straight, horizontal line; for the hand must neither rise upward like a ball nor be bent so as to slope downward.

The fingers are to be so bent that the tips of them, together with that of the thumb, when extended outward, may form one right line: and so that the keys may always be struck with the soft and fleshy tips of the fingers, and that neither the nails nor the flat surface of the fingers shall touch the keys. In striking the black keys, the fingers must be stretched out a little more; but even in this case they must always remain sufficiently bent.

The percussion on the keys is effected solely by the fingers, which, without any actual blow, must press each key firmly down; and in doing this, neither the hand nor the arm must be allowed to make any unnecessary movements. The thumb should always strike the key with the external narrow surface, and in so doing, it must be but very little bent.

The white keys are to be struck on the middle of their anterior broad surfaces, and the black keys pretty close to their nearest extremities or ends.

You must take great care that you do not strike any key sideways or obliquely; as otherwise a contiguous and wrong key may chance to be touched, and in music nothing is worse than *playing wrong notes*.

While one finger strikes, the other fingers must be kept close to the keys, but always bent, and poised quite freely in the air; for we must not touch any key before the moment in which it is to be struck.

The most important of the fingers is the *thumb*; it must never be allowed to hang down below the key-board; but, on the contrary, it should always be held over the keys in such a way that its tip may be elevated a little higher than the upper surface of the black keys; and it must strike from this position.

To observe all these rules exactly, it is requisite that the elbows should never be too distant from the body; and that the arms, from the shoulder downward, should hang freely, without being pressed against the body.

The necessity of all these rules you will not be able to comprehend till a future period.

The knowledge of the notes is a mere affair of memory; and for every note you must endeavor to find and strike the proper key, on the instant, and without the least hesitation. In music, this constitutes what is called *reading the notes*; and when you shall have acquired this readiness, you will have overcome the most difficult thing which elementary objects in music will be likely to present to you.

At first you will naturally learn only the notes in the treble clef; and for this purpose, we may employ the following means:—

First,—When you look at a note, you must name it aloud, and then seek for and strike the key which belongs to it.

Secondly,—When you strike at hazard any white key on the treble side of the key-board, you must name it aloud, and seek directly for the note belonging to it.

Thirdly,—After having struck any white key at hazard, you must describe aloud, in words, on what line or in what space the note belonging to it must be written.

Fourthly,—You must often play through, slowly, some of the easiest pieces for beginners, note by note, and with great attention, naming each note as you proceed.

Fifthly,—I must also recommend you to adopt the following expedient: since you are already much advanced in writing, as it becomes a young female of education to be, you must learn to write music. The little trouble that this will cost, you will find amply recompensed by great advantages. Notes are much easier to write than letters; and, if you daily devote a short quarter of an hour to this task, in a couple of weeks, you will become sufficiently expert at it.

Your teacher will give you the instructions requisite for this