

appliances of modern art, offers, in their probable results, an inviting illustration of the importance of one department of modern meteorology. It is, however, in special relation to climate and other contingent phenomena, alluded to in the March number of this Journal, that we desire to call the attention of those whose pursuits and inclinations may permit them to observe and record.

We have as yet no organization in Canada of meteorological observers. It is, however, gratifying to know that the prospect of a beginning is not far distant; and we trust that, in a very short time, our grammar schools and superior common schools may aid in establishing a work fraught with so great advantage to science as well as to the agricultural interests of this Province, and the commercial safety of our maritime sisters. We learn from the report of Dr. Henry, the able Secretary to the Smithsonian Institution, that, "during the past summer (1850) I visited Canada, principally for the purpose of examining the meteorological instruments, and the method of using them, employed at the Observatory of Toronto. Captain Lefroy, the director of this Institution, afforded me every facility for acquiring the desired information. He also furnished me with a list of military posts in Canada, at which observations may be made, and gave assurance of the hearty co-operation in our labours of the officers attached to these posts." The Smithsonian Institute recognizes three classes of observers,—the third class do not require the aid of instruments.

We propose in a future number of the *Journal* to describe the duties of observers belonging to this class, and to render the sketch more complete, we shall endeavour to indicate what and how to observe in Canada.—*Communicated.*

THE EARTH'S ROTATION ON ITS AXIS.

The ingenious experiment of M. Faucult of the oscillation of the pendulum as a test of the rotary motion of the earth, which has of late so much occupied the public attention, has likewise served to bring the whole subject of the earth's rotation into discussion. It is strange to think that, not more than two centuries ago, this same subject occupied the attention of men of science and intelligence throughout the whole of Europe, and we may say, the civilized world, though in a very different way. At the beginning of the seventeenth century, the doctrines of Copernicus, timidly divulged about fifty years before, were taken up by Galileo, and fully and boldly asserted. It took fifty years more, however, before they were even partially credited in Europe; and it is surprising to find the acute and learned, and, on the whole, very candid Sir Thomas Browne, even so late as 1646, denying his belief in such doctrines. In his 'Vulgar errors' is the following sentence—'Nor will it acquit the insatisfaction of those who quarrel with all things, or dispute matters concerning whose verities we have conviction from reason, or decision from the inerrable and requisite conclusions of sense. And therefore, if any affirm the earth doth move, and will not believe with us it standeth still, because he hath probable reasons for it, and I no infallible sense or reason against it, I will not quarrel with his assertion.' Now the somewhat quaint Sir Thomas was a thinker and writer in many respects far ahead of his times, yet he was on this question behind Galileo and his contemporary countryman, the immortal Milton. In his denial, however, he is not dogmatical; not so his commentator, Sir Christopher Wren, dean of Windsor, and father of the celebrated architect of St. Paul's. He denounces the new doctrine with vehemence, and without any reservation whatever, and may well be taken as a type of the prejudiced and ill-informed objectors of the time, as well as of all times, to any doctrine which disturbs the still quiet of old-fashioned and long-received opinion. It is amusing, and in some respects edifying, to glance over the various objections propounded in those days against the earth's rotation on its axis, and its annual revolution round the sun. If the earth rotates with such a velocity, say they, a stone thrown up into the air should be left a far way behind; and so should the air or atmosphere itself, and especially the water of the ocean. Now, to some extent the two latter at least of these phenomena do take place, but not in the way which the objectors suppose. In a general way the atmosphere and the ocean revolve as part and portion of the solid earth, and even the stone 'thrown up into the air' still continues to preserve its motion as a particle of the earth, and rather falls to the eastward than to the westward of its point of projection. But the chief objection was a scriptural

one; or rather a list of eighty contradictions from the Scriptures. Turn up a volume of Sir John Herschel, or any celebrated astronomer of the present day, and we shall readily find eighty such objections. With all our knowledge of the earth's rotation, we still speak of the sun 'setting and rising,' of the 'motions of the stars,' and the 'sun's course in the heavens;' in short, we still find it most convenient to use the language of the senses, not the intellectual language of the reality; and throughout the whole of Scripture nothing more is done than this.

The diurnal revolution of the earth is now one of those received and established facts which demand no proof. Abstracting our thoughts for a moment from the incongruities between vision and relative motions, we can at once discover, from watching the position of the sun, that we travel continually in this latitude at the rate of from 500 to 600 miles per hour; or at night, fixing our eye on the moon, that we far outstrip her in her progress, through the deep blue sky, though she also has her eastward course, as may be demonstrated by fixing on some far distant fixed star, when we shall find that during every passing hour and minute both the moon and earth recede, though with very different velocities, from the tiny twinkling orb.

We owe to one of England's most celebrated astronomers of former days, Dr. Halley, the first true exposition of the atmospheric currents. He first pointed out that in a current of air coming from the pole to the equator, there is a much less lateral velocity in high latitudes than in low: or, in other words, while the air at the equator is carried from west to east with a velocity of 1000 miles an hour, the air within the polar circles only moves with a velocity of 100 or 200 miles an hour, diminishing almost to nothing at the pole itself. From this circumstance arises the well-known direction of the trade-winds, north and south of the equator, which, instead of blowing directly north and south respectively, acquire a direction of north-east, and south-east. This circumstance, once ascertained, is perhaps one of the most self-evident proofs of the rotation of the earth—a proof not liable to the deception of vision, as many of the others are, but which can likewise be appreciated and confirmed by the other senses. When a current of cold, and consequently heavy air presses from the polar regions towards the equatorial, every degree it advances it comes over a portion of the earth that is revolving eastward at a greater velocity than that part which the current first left: when it arrives within the tropics, the earth's motion is from 900 to 1000 miles an hour, the motion of the wind-current is perhaps one-half less than this. The consequence is, that the earth outstrips the air-current, which, so to speak, is left behind. Now, we know that in travelling on a railway with a velocity of thirty miles an hour, if the air is not moving at all, we encounter a wind blowing at the rate of thirty miles an hour, forming a stiff breeze; but say that there is a gentle current blowing along with us of fifty miles an hour, still we outstrip it, and create for ourselves a counter current with half the velocity, or fifteen miles an hour.

Did the earth, then, not turn on its axis at all, the trade-winds ought always to blow due north and south respectively on each hemisphere.

The experiment of Faucult is, we presume, so well known to our readers, that we need not enter on it here. It derives its interest, as a proof of the earth's rotation, from the well-ascertained fact, that a pendulum continues to rotate in the same plane in which it has been set in motion. From this circumstance, and having a free motion at the point of suspension, it preserves its original plane of rotation while the point of suspension, and consequently the part of the earth's surface where it is placed, is making a daily revolution. This simple ingenious experiment has also the merit of affording a proof free from the fallacy of vision, of the earth's daily revolution on its axis.—*Edinburgh Journal.*

THE UTILITY OF KNOWLEDGE.

Not long since, while travelling through the interior of New York, we fell in company with a gentleman, who was a school officer, and the conversation very naturally related to education and its advantages. He stated, as the result of his observations, that in nearly all our schools much time and money were simply *thrown away*, in teaching children branches of knowledge which would be applied by them, in after life, to no practical purpose. And by way of illustration, he asks, what benefit can accrue from