

## APPLES IN STORE.

APPLES always, whether in barrels or piles, when the temperature is rising so that the surrounding air is warmer than the apples, condense moisture on the surface and become quite moist and sometimes dripping wet, and this has given the common impression that they "sweat," which is not true. As they come from the tree they are plump and solid, full of juice; by keeping, they gradually part with a portion of this moisture, the quantity varying with the temperature and the circulation of air about them, and being much more rapid when first picked than after a short time, and by parting with this moisture they become springy or yielding, and in a better condition to pack closely in barrels; but this moisture never shows on the surface in the form of sweat. In keeping apples, very much depends upon the surroundings; every variation in temperature causes a change in the fruit, and hastens maturity and decay, and we should strive to have as little change as possible, and also have the temperature as low as possible, so the apples do not freeze. Then, some varieties keep much better in open bins than others; for instance, the Greening is one of the best to store in bins. A very good way for storing apples is to have a fruit-room that can be made and kept at from 32° to 28°, and the air close and pure, put the apples in slatted boxes, not bins, each box holding about one barrel, and pile them in tiers, so that one box above rests on two below, and only barrel when ready to market; but this is an expensive way, and can only be practiced by those with limited crops of apples, and it is not at all practicable for long keeping, because in this way they lose moisture much more rapidly than when headed close in barrels, and become badly shriveled.

All things considered, there is no way of keeping apples quite so good and practicable as packing in tight barrels and storing in cool cellars; the barrel forms a room within a room, and prevents circulation of air and consequent drying and shrinking of the fruit, and also lessens the changes of temperature, and besides more fruit can be packed and stored in a given space than in any other way. The poorest of all ways is the large open bin, and the objections are: too much fruit in contact; too much weight upon the lower fruit; and too much trouble to handle and sort when desirable to market. It was formerly the almost universal custom in Western New York to sort and barrel the apples as fast as picked from the trees, heading up at once and drawing to market or piling in some cool place till the approach of cold weather, and then putting in cellars. By this method it was impossible to prevent leaves, twigs, and other dirt from getting into the bin, and it was difficult to properly sort the fruit, and if well sorted, occasionally an apple, with no visible cause, will entirely and wholly rot soon after packing. Some varieties are more liable to do this than others, but all will to some extent; this occurs within a week or ten days after picking, and, when barreled, these decayed apples are of course in the barrels, and help to decay others. Although packed ever so well and pressed ever so tight, the shrinking of the fresh-picked fruit soon makes them loose, and nothing is so bad in handling apples as this. Altogether this was a very untidy method of handling apples, and has been entirely abandoned for a better.

The very best method depends a good deal upon the quantity to be handled; if only a few hundred barrels, they can be put in open barrels and stored on the barn floor. Place empty barrels on a log-boat or old sled; take out the upper head and place it in the bottom of the barrel; on picking the apples put them, without sorting, directly into these barrels, and when a load is filled, draw to the barn and place in tiers on end along one side of the floor; when one tier is full lay some strips of boards on top and on these place another tier of barrels; then more boards and another tier; two men can easily place them three tiers high, and an ordinary barn floor will in this way store a good many barrels of apples. Where many hundreds or thousands of barrels are grown, it is a good plan to build houses or sheds in convenient places in the orchard for holding the apples as picked; these are built on posts or stones, about one foot from the ground; floors, sides, and ends should be made of strips about four inches wide and placed one inch apart, and the roof should project well on every side. The apples, as picked, are drawn to these in boxes or barrels and piled carefully on the floors, about three feet deep. Where these houses are not provided, the next best way is to pile the apples, as picked, on clean straw under the trees in the deepest shade to be found.

After lying in any one of these positions about ten days they should be carefully sorted and packed in clean barrels, placing at least two layers on the bottom of the barrels, with stems down; after this fill full, shaking moderately two or three times as the filling goes on, and, with some sort of press, press the head down, so that the apples shall remain firm and full under all kinds of handling. Apples may be pressed too much as well as too little. If pressed so that many are broken, and badly broken, they will soon get loose and rattle in the barrels, and nothing spoils them sooner than this. What we want is to have them just so they shall be sure to remain firm, and carefully shaking so as to have them well settled together, has as much to do with their remaining firm as the pressing down of the head. After the barrels are filled and headed they should at once be placed on their sides in a barn or shed, or in piles, covered with boards, from sun and rain, or if a fruit-house or cellar is handy they may at once be placed therein; the object should be to keep them as cool and at as even a temperature as possible. In all the operations of handling apples from picking to market, remember that carelessness and harshness always bruise the fruit, and that every bruise detracts much from its keeping and market value; and remember another thing, that "Honesty is the best policy."

—J. S. Woodward, in N. Y. Tribune.

## ON DETERMINING THE SUN'S DISTANCE BY A NEW METHOD.

By T. S. H. EYTINGE, Cainsville, Canada.

It is well known that the sun's distance has been determined from the velocity of light. It has been found, by terrestrial experiments, about how fast light travels, and, knowing from certain astronomical phenomena the time light requires to pass from the sun to the earth, we have been able to determine the sun's distance.

There are several methods of determining the velocity of light, but hitherto only two plans have been used to detect the time light occupies in passing from the sun to the earth. This time was first discovered by observations of the satellites of Jupiter. It was found that the interval between the eclipses of these bodies was not always the same—that the

eclipses occurred earlier when Jupiter was nearest the earth, and later when he was at his greatest distance. Roemer, a Danish astronomer, first detected the cause of this variation. The second method by which this time has been found is the aberration of stellar light. This refined method was detected by the great English astronomer Bradley.

About two years ago it occurred to me that a third method can be used to solve this important problem. My plan is this: It is well known that many variable stars, such as Algol,  $\sigma$  Libræ, U Coronæ, and the remarkable variable D. M. +1 3408°, discovered by Mr. E. F. Sawyer, fluctuate at regular intervals. Now, I believe it is possible to determine very accurately the intervals between these changes, and, by noting the change of time in these intervals, when the earth is in different points of its orbit, we get the time light requires to cross that orbit. For, as in the case of the satellites of Jupiter, when the star is "in opposition," the changes will occur earlier than when it is in conjunction or approaching that point. I have recently put this plan to the test, and hope before long to make known the results.

In detecting the changes of variables. I have attempted to substitute, in place of the ordinary eye observations, a very delicate thermopile, which registers the changes in the star's heat. So far as I know, this is the first application of the thermopile to variables.

## PROFESSOR HAECKEL ON DARWIN.

In *Nature* appears a report of the remarkable address given by Professor Haeckel at the recent Eisenach meeting of the German Association of Naturalists on the theories of Darwin, Goethe, and Lamarck. The address is mainly devoted to Darwin and Darwinism, and of both, we need scarcely say, Professor Haeckel has the highest estimate. He said:

"When, five months ago, the sad intelligence reached us by telegraph from England that on April 19 Charles Darwin had concluded his life of rich activity there thrilled with rare unanimity through the whole scientific world the feeling of an irreparable loss. Not only did the innumerable adherents and scholars of the great naturalist lament the decease of the head master who had guided them, but even the most esteemed of his opponents had to confess that one of the most significant and influential spirits of the century had departed. This universal sentiment found its most eloquent expression in the fact that immediately after his death the English newspapers of all parties, and pre-eminently his Conservative opponents, demanded that the burial-place of the deceased should be in the Valhalla of Great Britain, the national Temple of Fame, Westminster Abbey; and there, in point of fact, he found his last resting-place by the side of the kindred-minded Newton. In no country of the world, however, England not excepted, has the reforming doctrine of Darwin met with so much living interest or evoked such a storm of writings, for and against, as in Germany. It is, therefore, only a debt of honor we pay if at this year's assembly of German naturalists and physicians we gratefully call to remembrance the mighty genius who has departed, and bring home to our minds the loftiness of the theory of nature to which he has elevated us. And what place in the world could be more appropriate for rendering this service of thanks than Eisenach, with its Wartburg, this stronghold of free inquiry and free opinion! As in this sacred spot 360 years ago Martin Luther, by his reform of the Church in its head and members, introduced a new era in the history of civilization, so in our days has Charles Darwin, by his reform of the doctrine of development, constrained the whole perception, thought, and volition of mankind into new and higher courses. It is true that personally, both in his character and influence, Darwin has more affinity to the meek and mild Melancthon than to the powerful and inspired Luther. In the scope and importance, however, of their great work of reformation the two cases were entirely parallel, and in both the success marks a new epoch in the development of the human mind. Consider, first, the irrefragable fact of the unexampled success which Darwin's reform of science has achieved in the short space of 23 years! for never before since the beginning of human science has any new theory penetrated so deeply to the foundation of the whole domain of knowledge or so deeply affected the most cherished personal convictions of individual students; never before has a new theory called forth such vehement opposition and so completely overcome it in such short time. The depiction of the astounding revolution which Darwin has accomplished in the minds of men in their entire view of nature and conception of the world will form an interesting chapter in the future history of the doctrine of development."

Describing a visit which he paid to the late Mr. Darwin in 1866, Professor Haeckel says:

"In Darwin's own carriage, which he had thoughtfully sent for my convenience to the railway station, I drove one sunny morning in October through the graceful, hilly landscape of Kent, which, with the checkered foliage of its woods, with its stretches of purple heath, yellow broom, and evergreen oaks, was arrayed in the fairest autumnal dress. As the carriage drew up in front of Darwin's pleasant country-house, clad in a vesture of ivy and embowered in elms, there stepped out to meet me from the shady porch, overgrown with creeping plants, the great naturalist himself, a tall and venerable figure with the broad shoulders of an Atlas supporting a world of thoughts, his Jupiter-like forehead highly and broadly arched, as in the case of Goethe, and deeply furrowed by the plow of mental labor; his kindly, mild eyes looking forth under the shadow of prominent brows; his amiable mouth surrounded by a copious silver-white beard. The cordial, prepossessing expression of the whole face, the gentle, mild voice, the slow, deliberate utterance, the natural and naïve train of ideas which marked his conversation, captivated my whole heart in the first hour of our meeting, just as his great work had formerly, on my first reading it, taken my whole understanding by storm. I fancied a lofty world-sage out of Hellenic antiquity—a Socrates or Aristotle—stood alive before me. Our conversation, of course, turned principally on the subject which lay nearest the hearts of both—on the progress and prospects of the history of development. Those prospects at that time—16 years ago—were bad enough, for the highest authorities had for the most part set themselves against the new doctrines. With touching modesty, Darwin said that his whole work was but a weak attempt to explain in a natural way the origin of animal and vegetable species, and that he should not live to see any noteworthy success following the experiment, the mountain of opposing prejudice being so high. He thought I had greatly overestimated his small merit, and that the high praise I had bestowed on it in my 'General Morphology' was far too exaggerated."

"We next came to speak of the numerous and violent attacks on his work, which were then in the ascendant. In

the case of many of those pitiful botches one was, in fact, quite at a loss whether more to lament the want of understanding and judgment they showed or to give the greater vent to the indignation one could not but feel at the arrogance and presumption of those miserable scribblers who pooh-pooed Darwin's ideas and bespattered his character. I had then, as on later occasions, repeatedly expressed my just scorn of the contemptible clan. Darwin smiled at this, and endeavored to calm me with the words, 'My dear young friend, believe me one must have compassion and forbearance with such poor creatures; the stream of truth they can only hold back for a passing instant, but never permanently stem.' In my later visits to Down in 1876 and 1879 I had the pleasure of being able to relate to Darwin the mighty progress which in the past intervals his doctrines had made in Germany. Their decisive outburst happened more rapidly and more completely here with us than in England, for the reason chiefly that the power of social and religious prejudice is not nearly so strong here as among our cousins across the Channel, who are better placed than ourselves. Darwin was perfectly well aware of all this; though his knowledge of our language and literature was defective, as he often complained, yet he had the highest appreciation of our intellectual treasures."

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