In the past season such attacks as that of the great caterpillars (four inches or more in length) of the Lappet Moth, the *Gastropacha quercifolia* scientifically, to apple leafage; or again, the presence of caterpillars of the little *Pyralis glaucinalis* might reasonably be supposed to be influenced by weather. In the first case, the great size of the larva feeding on the leafy twig exposes it much to alternations of weather, and in the second, where, as in the samples sent me, the infestation was located in the outer part of fodder stacks, the penetration of wet which might soak the filmy cocoons with their developing contents, would cause conditions very different to the long-continued appearances of the present summer.

To go through the different orders of insects, specially represented, or the different dates and amounts of their appearance on the crops, would be too long here, but I can safely say that whilst the drought lasted I had constant applications regarding insect appearances, including a much greater variety than usual of kinds little observed in ordinary years, and in some cases unusual amount of presence of our common kinds.

Various representatives of the Acarina, as the currant, pear, and plum Phytopti were of course largely noticed, as also the Phytopti (or gall mites) of the hazel buds, of which the galls loaded the hazel boughs in this neighbourhood early in May to a degree I have never before seen. The kind of (so-called) "red spider" (*Bryobia prætiosa*) which ordinarily is chiefly found on ivy, extended its injurious presence so widely to gooseberry leafage as to necessitate careful, and happily successful, measures to get it under.

Why, with all this, various crop insect attacks were less reported than customarily remains uncertain. Corn Aphides as yet have not been complained of. Possibly this is by reason of the heat hardening the ears so that they were in a condition to withstand attack before the Aphides arrived on the heads to endeavour to pierce into them with their suckers. In countries where the climatal conditions can be counted on, this point (of arranging date of crop so as to protect itself from attack) is one of the regular methods of prevention. Another infestation which threatened to be very troublesome, but of which the second brood did not make any noteworthy appearance in various places, is that of the mustard beetle. Why this should be so I am as entirely at a loss to explain as the crop inspector who reported the state of things to me.

Various other absences of attack remain also unexplained, but are duly noted for possible future service in agricultural entomology.

So far as I can gather from contribution of my own correspondents, or other accessible sources of information, I should consider that such extra amount of insect presence as has occurred, has been owing to weather influence. We have had earlier and more numerous development of many kinds, and also in the case of various common crop insect pests, the hardness of the soil, and other conditions incident to drought, which made it totally impossible to bring either stimulating dressings, or mechanical measures to bear, necessitated our permitting increase to go on unchecked in some cases, and in some, though the caterpillars just below the surface of the ground necessarily did not themselves multiply, their unattainable legions swelled the numbers of observable pests, and probably will supply us a plentiful brood of moths for further continuation of species.

There does not appear to be any reason from previous circumstances, or from importations, to consider that we were suffering from other than the ordinary attacks, which, in a changeable climate like ours, must be changeable in their amounts; at least, so it appears to me from such an amount of report as I possess.

ELEANOR A. ORMEROD.

THE GREAT HEAT OF AUGUST 8 TO 18.

AN extraordinary wave of high temperature passed over this country between the 8th and 18th of this month, which has also been remarkable on account of the continuance of the heat during several consecutive days. High temperatures were experienced in all parts of the United Kingdom, but more especially in the southern and eastern portions of the country. The following table shows their distribution as represented by the stations included in the *Daily Weather Report*:—

Stations.	Days with temperature of 75° or more.	Days with temperature of 80° or more.	Days with temperature of 85° or more.	Days with temperature of 90° or more.	Days with temperature of 75°–90° or more.	Maximum temperature.	Date.
						°	
Leith	5	—	1	—	6	85	15
North Shields ...	3	2	—	—	5	83	18
York	5	4	1	—	10	86	18
Loughborough ...	1	4	5	1	11	91	18
Liverpool	4	2	1	—	7	85	17
Parsonstown	5	2	—	—	7	82	14 and 16
London	—	4	4	3	11	93	18
Oxford	4	2	5	—	11	89	17 and 18
Cambridge	3	2	4	2	11	92	18
Jersey	4	4	3	—	11	89	17

A glance at this table shows that at Loughborough, Oxford, Cambridge, London, and the Channel Islands the temperature reached or exceeded 75° on every day of the period in question, the maxima reaching 91° at Loughborough on the 18th, 89° at Oxford on the 17th and 18th, 92° at Cambridge on the 18th, 93° in London on the 18th, and 89° at Jersey on the 17th.

At Greenwich the temperature exceeded 80° on each successive day from the 8th to the 18th inclusive, the highest readings being 93° on the 16th, 94°2 on the 17th, and 95°1 on the 18th. The last reading has only been exceeded twice at any time of the year during the last half-century, viz., 96°6 on July 22, 1868, and 97°1 on July 15, 1881. The highest reading in the sun during the eleven days in question was 146°2 on the 18th, but this temperature was slightly exceeded in June last. Mr. Symons states that, on the 18th instant, the thermometer at his station at Camden Town registered 93°6, which has only once been exceeded during thirty-six years (1858–93), viz., on July 15, 1881, when it read one degree higher; the present is the only year with a maximum shade temperature above 90° for three consecutive days. On the night of the 17th instant the minimum temperature in South London was as high as 72°, being rather above the average maximum temperature for the month of August, and the daily mean, as deduced from the maximum and minimum readings in the *Daily Weather Report* for the 18th, was 82°·5; this mean value is probably the highest on record since trustworthy observations have been taken. In a valuable paper recently read by Mr. Ellis before the Royal Meteorological Society, the average mean temperature at Greenwich for that day is given as 62°5.

On the Continent the highest readings quoted in the *Daily Weather Report* were 102° and 106° at Rochefort in France on the 13th and 14th instant, while the maximum readings there reached or exceeded 90° on seven consecutive days. In the South of France the temperature exceeded 80° on each day of the period in question, 100° being recorded at Biarritz on the 17th.

The Weather Charts published by the Meteorological

Office during this period show that the conditions were mostly anti-cyclonic, both over this country and the Continent, with the exception of a depression in the south-west, which caused some sharp thunderstorms on the 9th and 10th. On the 18th another depression appeared off our north-west coasts, causing a gale in those parts, while strong winds and lightning occurred generally, with heavy rain in the west. These conditions checked the excessive heat; on the 19th the maximum temperature in London was 15°, and at Paris 25°, lower than on the previous day.

A SENSITIVE SPHEROMETER.

THE ordinary spherometer has three arms carrying three fixed points, with a point moved by a screw in the centre. This form is an improvement on the original spherometer invented by Andrew Ross, and for which the Society of Arts gave him a silver medal in 1841.

A description of Ross's instrument is given by Holtzapffel, vol. iii. p. 1271 of his work on "Turning and Mechanical Manipulation," extracted from vol. liii. of the Transactions of the Society of Arts. This instrument could measure to $\frac{1}{1000}$ of an inch, and by estimation half this amount. An ordinary spherometer, with a screw of $\frac{1}{100}$ of an inch pitch and head divided to hundredths, will measure to $\frac{1}{10000}$ of an inch.

I pointed out in vol. l. page 145, of the Memoirs of the Royal Astronomical Society that the sensitiveness of the ordinary spherometer was much increased by placing the screw not in the centre, but in one of the arms in place of one of the fixed points; this at once increased the sensitiveness of the screw in proportion to the distance of the screw from the nearest fixed point, and this fixed point from a line joining the other two fixed points.

The improvement I wish to bring before those interested in spherometers by this note, is the extension of this principle, for by carrying the middle point much nearer the line joining the other two, a proportionate increase of sensitiveness is obtained.

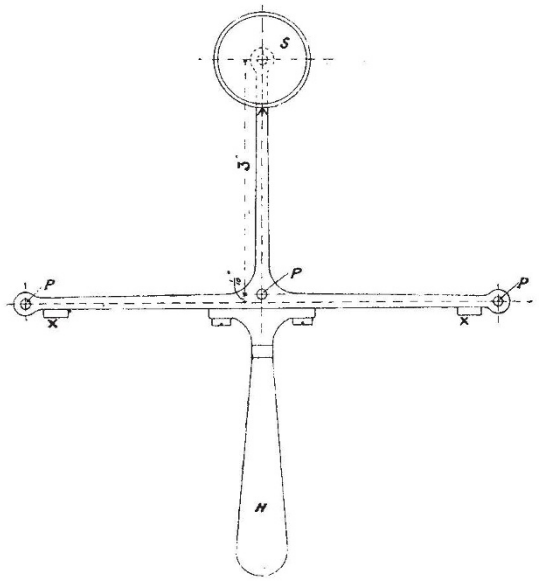
In the case of an instrument I have made on this plan I have increased the sensitiveness thirty times, the distance from the middle point to the screw being three inches, and the distance of the point from the line of the other two being $\frac{1}{10}$ of an inch; with a screw of one hundred threads to the inch and a head divided to hundredths, the ordinary form of instrument will read to $\frac{1}{10000}$, but on the plan I give, the same screw will measure $\frac{1}{300000}$ of an inch.

There is an additional advantage in this form, that the curvature of a part nearly in a line is measured, so that cross measures can be taken.

The form of the instrument is not symmetrical, and it requires to be balanced, so that when the screw is raised it will be possible to estimate the frictional contact of the outside points when the middle one is taking the weight. This balancing is easily done by adding a handle to the part opposite the arm carrying the screw; in practice it is found that this handle is of the greatest value in keeping the heat of the hand from the instrument, as even with the ordinary instrument, holding it for a short time in the hand alters the readings materially.

It is of great advantage to have on the arms carrying the two outer pins two pieces of wood or ivory projecting not quite as much as the measuring points, so that by tilting the instrument up these two pieces come first into contact with the surface to be measured, then by gradually raising the handle the points are brought gently into contact. The figure is a plan of this spherometer, and shows the position of the three fixed points P P P with reference to the measuring screw S, and the position of the balancing handle H with reference to the unsymmetrical arm carrying the measuring screw; X X are the projecting pieces already mentioned.

The movement of the screw being so large for a slight curvature, this instrument is more particularly useful for measuring the slight curvatures of so-called plane mirrors,



PLAN

for which, indeed, it was designed. To make it available for measuring differences between parts of a curved surface of considerable curvature the middle pin should be a screw capable of movement to, and clamping, in a position, that will allow the measuring screw to work.

A. A. COMMON.

JEAN DANIEL COLLADON.

DANIEL COLLADON, the celebrated physicist and engineer, died on June 30, at Cologny, near Geneva.

Colladon was born at Geneva, December 15, 1802. He belonged to a Protestant family from Berry, which removed from France, in the middle of the sixteenth century, on account of religious persecutions, and found refuge in Calvin's town. Many a distinguished magistrate came from this family, amongst others the learned juris-consult, Germain Colladon.

While still quite young Colladon proved to be wonderfully intelligent, and had a remarkably observant mind.

He went through the College and then the Academy of Geneva, which at that time had, among its professors, A. P. de Candolle, M. Aug. Pictet, Th.de Saussure and Prevost. His liking for science could not but develop itself in contact with these eminent men, whose esteem he soon gained.

At the age of ten years he made friends with Charles Sturm, who became a noted mathematician, and was on later occasions his fellow-worker. His inventive nature and talent for experimental inquiry turned itself above all to physics and its mechanical applications.

He was just twenty-two when he received from the Society of Science of Lille a first prize for the invention of a new photometer. At twenty-three he went to finish his studies at Paris. He lived there for about ten years, leading a simple life, almost entirely devoted to work.

He was received in a most flattering manner for such a young man by the pleiades of celebrated men, which the