that they are surrounded by highly artificial conditions, excluded from the benefit of outdoor influences, and to a large extent from the action of insects, at this critical stage of their growth. After Vines in a vinery begin to expand their flowers the process goes on till they have all opened, which does not generally occupy more than a week; day by day the petals are to be seen drooping, and the flowers opening. Each morning while the Vines are in flower—from 10 to 12 o'clock if the day is bright, an hour later if dull—a large number of flowers will have opened, the anthers will be found loaded with pollen ready to discharge. A smart stroke of the hand, repeated a few times on the trellis in the forenoon and afternoon, will cause the whole to vibrate, sending up and dispersing clouds of pollen in all directions, securing a good set of most sorts. With shy-setting varieties, in addition to the above, while the temperature is high, and the atmosphere somewhat dry, I once a day have the whole of the bunches gone over. Spring the finger sharply against the upper part of the fruit-stalks, avoiding the too prevalent custom of drawing the hand over the bunches, which frequently injures the embryo fruit, causing that rough, unsightly appearance on the skin of the Grape which is often confounded with what is technically called "rust."

The Black Morocco, the Muscat Escholata, and the Canon Hall Muscat, are the only varieties I have ever failed to set when treated as just described. The flowers of these varieties are often deficient in pollen, and require to have pollen provided from other sources, and applied in any of the ways generally adopted.

When thus treated, I have always found even the Black Morocco, the shyest of all setters, to set like a Hamburgh.

To grow a bunch of Grapes—say for exhibition purposes—it is of importance that it be finished in every respect, of symmetrical form, &c.; but one of the most important points is, that the berries be large for the variety and uniform in size. If more attention were paid to setting Grapes in our cloudy climate, equal-sized berries would be more frequently seen than they are at present.

Vines do not swell their berries equally even when in luxuriant health; many set and swell a little, not growing much larger than pin-heads; others swell to be as large as peas and colour prematurely; others grow about half the ordinary size, and are generally without fertile seeds; others swell to full size, producing perfect seeds. It is neither necessary nor desirable that every flower should set and swell to full size; but it not unfrequently happens that a sufficient number of full-sized berries are not produced, the bunches after being carefully thinned having a number of undersized berries. I do not wish to dogmatise on this subject as other causes tend to produce similar results, still when some bunches swell a sufficient number of full-sized berries, while on other bunches on vigorous shoots, on the same Vine it may be, not more than half the berries swell to full size, I cannot help thinking that imperfect impregnation has had to do with this, and that attention at the proper season would have prevented it, as is demonstrated in the case of the Black Morocco.

I have observed that the Muscat Hamburgh, when forced early, as well as some other varieties, is more liable to fail in this respect than when grown later, and thus having the advantage of a longer day and more sunshine when in flower.

It would be a very interesting question to ascertain, whether, when a berry is once impregnated, other conditions being favourable, it will grow to maturity, and swell to full size, or whether there be such a thing as partial fecundation, causing less or more growth of the berry, tending to produce imperfect fruit? My observation leads me to conclude that the latter question should be answered in the affirmative; if so, it is a reasonable inference that more attention should be paid in aiding the fertilisation of our forced Grapes.

There are many causes at work to prevent Vines setting their fruit freely, which we do not always discover. In my experience one or two things occur to me which illustrate this, and which I may be excused for noticing here. A good many years ago I had charge of some Vines which were in fine health, without being extra luxuriant: a Vine of the West's St. Peter's was planted near one end of the house. The greater number of the flowers suddenly dropped off from a number of the most advanced bunches before a single flower had expanded, leaving the fruit-stalks of numerous bunches without a flower or set berry on them. Had the flowers expanded and then fallen off, I should have attributed it to the want of impregnation from some cause. After a careful examination I discovered that the border was very dry at that end of the house, which stood higher than the other end, the house having been built on hanging ground; a liberal supply of water was at once administered, the remainder of the bunches flowered in due course, and set their fruit abundantly—the dryness at the roots telling on the tender organs of the flower before it was apparent on the foliage or general health of the Vine.

Another and important point to aid in setting Grapes to swell their berries regularly is to have the wood well ripened. I have frequently observed strong grown young Vines, with the wood indifferently ripened, set badly, particularly Muscats. Unless the flowers are perfect, which is not the case unless last year's wood has been perfectly ripened, no aid in fertilisation will secure a good set. This is better understood, and more generally admitted amongst Peach than Grape growers.

New Garden Plants.

ACINETA SULCATA, *n. sp.**

This is an interesting novelty. If it had not two special features at once I would not dare to name it, since I have but a single flower at hand, half-dried, which arrived in my absence, and which looks like a yellow Acineta Humboldtii. It was a very queer sulcate "sella turcica," with two teeth in front, and two larger and two smaller ones on the base; then there are exceedingly developed wings lying on the hinder side of the side partitions, adnate a greater part to them; finally, a good part of the column is hairy. I have a sketch of Wallis', no doubt from New Granada or Ecuador, answering to it very well. It was sent from the gardens, Brantingham Thorpe, Brough, East Yorkshire, by Mr. Kingston, gr. to Chris. Sykes, Esq., M.P. *H. G. Rchb. f.*

EXPERIMENTS WITH KUBANKA AND SAXONICA WHEAT.

FIRST YEAR'S EXPERIMENTS AND RESULTS.

IN April, 1878, I had the honour of receiving the following letter:—

"Down, Beckenham, Kent, April 24.

"My dear Sir,—I send you herewith some specimens which may perhaps interest you, as you have so carefully studied the varieties of Wheat. They were sent me by the governor of the province of Samara in Russia, at the request of Dr. Asher (son of the great Berlin publisher), who farmed for some years in the province. The specimen marked Kubanka is a very valuable kind, but which keeps true only when cultivated in fresh steppe-land in Samara and in Saratoff. After two years it degenerates into the variety Saxonica, or its synonym Ghirca. The latter alone is imported into this country. Dr. Asher says that it is universally known, and he has himself witnessed the fact, that if grain of the Kubanka be sown in the same steppe-land for more than two years it changes into Saxonica. He has seen a field with parts still Kubanka, and the remainder Saxonica. On this account the Government, in letting steppe-land, contract that after two years Wheat must not be sown again until an interval of eight years.

"The ears of the two kinds appear different, as you will see, but the chief difference is in the quality of the grains. Dr. Asher has witnessed sales of equal weights of Kubanka and Saxonica grain, and the price of the former was to that of the latter as 7 : 4. The peasants say that the change commences in the terminal grain of the ear. The most remarkable point, as Dr. Asher positively asserts, is that there are no intermediate varieties; but that a grain produces a plant yielding either true Kubanka or true Saxonica. He thinks that it would be interesting to sow here both kinds, in a good and bad Wheat soil, and observe the result. Should you think it worth while to make any such trials, and should you require further information, Dr. Asher, whose address I enclose, will be happy to give any in his power. I hope that I have not troubled you uselessly, and remain,

"My dear Sir, yours faithfully,

(Signed) "CH. DARWIN.

"Mr. A. Stephen Wilson."

On receiving the two Wheats described in Mr. Darwin's letter, I immediately set to work. I was occupied at the time repeating M. Fabre's experiments with Ægilops, and it was possible the one set of experiments would throw some light upon the other. But before detailing my first year's operations, I would beg to give such description of Kubanka and Saxonica Wheat as may help to show in what particulars the one differs from the other.

Kubanka belongs to the class of Wheats called turgid. The ear is compact or thickset, there being on each side of the rachis four spikelets in the length of an inch, and eight or nine ranks of spikelets in the ear. The glumes are very smooth and reflect the light. The awns are about twice the length of the rachis. In the ears sent to me none of the spikelets had more than two grains or fertile florets. The straw, for some distance below the ear, is nearly solid. The grains are about .24 of an inch in length, and of a faint yellow colour, the average weighing about .56 of a troy grain, and the best seeds .66, and a good ear containing about thirty-six seeds. (Fig. 93—figs. 1 and 3).

Saxonica is not distinguishable from ordinary awny spring Wheat. It has an open or thin-set ear, there being three spikelets on a side in about the length of 1 inch, and seven or eight ranks in the ear. The awns are about the same length as the rachis. In some of the ears the chaff-scales (glumes and pales) are reddish, and in others white. The straw or culm is a hollow tube throughout. The grain is what is called a red Wheat, and is about .25 of an inch in length, weighs on an average .45 of a troy grain, the best seeds weighing .52, and the best ears containing from thirty to forty seeds. (Fig. 93—figs. 2 and 4).

The Kubanka figures on the left hand of the illustration (1, 3, 5, 7, 9,) may be compared with the Saxonica figures on the right (2, 4, 6, 8, 10). Figs. 1 and 2 are the edge views of ears as traced directly on thin horn plates, the awns being shortened for want of room. Fig. 3 is a front view of a Kubanka spikelet of two grains; fig. 4 the same view of a Saxonica spikelet of three grains, though many of the spikelets have only two; fig. 5 is a transverse section of a grain of Kubanka near the middle, to show the form of the grain; fig. 6 is the corresponding section of a grain of Saxonica; fig. 7 is a transverse section of the coats of a Kubanka grain as expanded in water and magnified 184 times; fig. 8 is the corresponding section of Saxonica, *a*, *a*, is the epicarp, which is thicker in the Kubanka than in the Saxonica in the proportion of 100 to 74; *b*, *b*, is a delicate membrane underlying the epicarp; *c*, *c*, is the proper exterior of the fruit, in which is developed the colouring matter which makes one Wheat a "white" Wheat, another a "yellow," and another a "red." The Kubanka is a yellowish Wheat, the Saxonica a reddish. Under the testa lies a matrix of clear gum, extending from *c* to *f* and running up the veins through the starch granules towards the midrib. In the matrix, *c*, *f*, the cells, *e*, *e*, lie over the whole exterior of the grain. Seen from above, or in plan, they are nearly hexagonal in form, as if an irregular honeycomb were deposited on the surface, with canals of transparent gum between the cells. The aleurone grains filling these cells are small, and give the albuminoid reaction with iodine.

* *Acineta sulcata*, n. sp. — Affinis Acinetæ Humboldtii: labello simpliciter curvato, laciniis lateralibus dolabriformibus margine posteriori lamina semiadnata oblonga incumbente, lacinia mediana cuneato ligulata obtuse acuta, callo disci humili lineari-ligulato sulcato, antice bidentato, postice dentibus duabus obtusis extrorsis, denticulis obsoletis geminis interpositis; processu ligulato obtuse postico retrorso supposito; columna ante apicem circacircum pilosa.—Flores verosimiliter flavi.

This important tunic is thicker in Kubanka than in Saxonica, in the ratio of 100 to 92. Under the hexagonal cells lies the mass of starch, *f*, *f*, subdivided into small deposits by the carpellary venation. No difference of any value can be detected in this region of the grains compared. Figs. 9 and 10 are cross sections of Kubanka and Saxonica embryos, at a point where three roots, *r*, *r*, *r*, are bisected. It will be seen from the figures that while the interior extremity of the scutellum, *sc*, in the Kubanka, fig. 9, is slightly convex towards the midrib or starch,

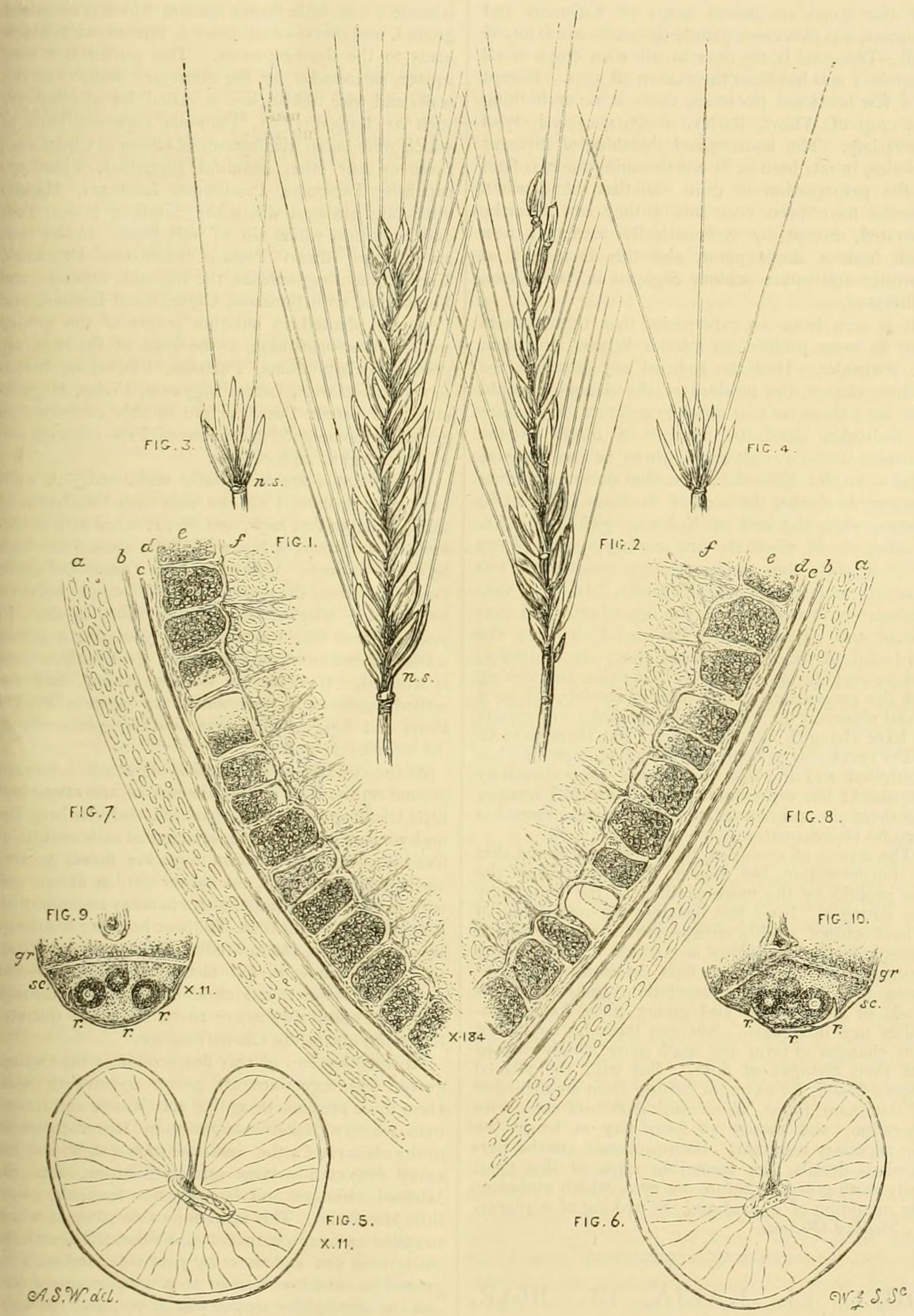

FIG. 93.—RUSSIAN WHEAT.

Figs. 1, 3, 5, 7, 9, relate to Kubanka Wheat; figs. 2, 4, 6, 8, 10, relate to Saxonica Wheat. Figs. 1—4 are nat. size, the others magnified. (See text.)

that of the Saxonica presents an angular point. Undoubtedly other differences would be found in a full comparison of the embryo in all their aspects; but as at present we do not know whether differences such as the one here pointed out have any specific value, or any morphological import, the subject need not be further pursued.

I shall now proceed to describe my experiments. In germinating, the Saxonica took the lead very decidedly, both sorts being put in damp cloth on April 27, 1878. On the 29th, seeds of both the Wheats were planted in the east border of the garden, in rows 9 inches apart, the seeds being deposited at intervals of 3 inches, at depths of about half-an-inch. At this station there were two rows of each Wheat, one row of each being an outside row, so as to give equality of conditions, it being known from former experiments that the outside rows always grow best. At the same time seeds of each sort were also planted in a better exposure close to the garden wall facing the south. On April 30 seeds of both sorts were planted 3 inches apart and about 1 inch deep in a continuous line near the border of a field just sown with Oats, the position being marked by pins. These seeds, like the others, had been put in damp cloth to germinate on the 27th, and while all the Saxonica were distinctly showing indications of germination only a few of the Kubanka had begun to awaken.

In brairding, the Saxonica also took the lead, the first leaf being stronger, taller, and broader than in the Kubanka. But all the Kubanka as well as Saxonica seeds planted in the garden ultimately brairded. The difference in hue between the two sorts when the first leaves were about 2 inches in height was very observable, the Kubanka being a much lighter green than the Saxonica. Probably all the Wheats which have white grains have leaves of a lighter green than those which have red grains.

When the plants in the garden were eight weeks old and about 12 inches high, the tillers or culms were counted and found to number as follows:—

(1). At south wall. Best soil and situation.

Kubanka. No of Culms on each Plant.						*Saxonica.* No. of Culms on each Plant.					
7	6	5	6	6	8	3	3	5	3	6	5
8	8	7	5	4		7	7	7	4	8	7
Average number, 6 3⁶.						Average number, 5.42.					

(2). At east wall. Medium station.

Kubanka.

7	5	5	5	4	10	10	7	7
5	4	6	5	4	4	5	5	3
5	4	5	4	3	4	3	4	4
3	4	3	3	8	4	4	4	4
4	5	6	5	3	3	3	2	5
6	9	8	8	5	0	10	5	8
10	9	8	8	10	11	4	7	6
6	6	6	8	3	4	4	5	6
4	4	5	4	5	4	5	4	5
5	6	6	5	5	4	2		

Average number, 5 33.

Saxonica.

6	10	7	13	7	9	10	10	9
9	9	12	10	8	10	9	9	8
7	9	11	10	8	9	7	9	11
8	10	6	7	9	8	9	9	7
4	8	7	7	6	7	3	6	5
14	9	10	8	7	8	8	11	8
13	8	8	8	7	7	10	7	9
8	6	6	8	10	11	7	5	6
10	8	7	4	5	7	9	5	9
7	7	6	2	4	4			

Average number, 7.97.

Eleven Kubanka plants in the best position (the twelfth being killed by a grub) thus gave an average of 6.36 stalks; while twelve Saxonica similarly placed gave an average of 5.42. In the medium station eighty-eight Kubanka plants gave an average of 5.33 stalks, while eighty-seven Saxonica plants beside them gave an average of 7.97. The greatest number of stalks on a stem of Kubanka at eight weeks old was eleven, the smallest two; the greatest number of stalks on a stem of Saxonica (occurring twice) was thirteen, the least two.

Up till the beginning of July, at which time red-rust (Trichobasis rubigo-vera, Lev.) began its attack, the Saxonica in the medium station was much healthier-looking, and stronger and taller than the Kubanka. Little more tillering had taken place in the Kubanka, but the Saxonica went on adding stalks till there were three or four times as many on the stock of Saxonica as on that of Kubanka. The numbers would have been counted and accurately given when the final tillering had ceased, but in July, as already stated, an enemy had come upon the scene. And although hitherto the Saxonica had looked by far the most vigorous, it was now attacked by red-rust, which gradually spread over the leaves into a complete orange blaze, while for a considerable time the Kubanka within a few inches of it, and indeed mixing ears with it in the play of the summer wind, looked as if it would entirely escape. The ears of the Saxonica were not affected by the rust up to July 19, at which time flowering began. At this date the Kubanka had overtopped its contemporary, and began to flower about the 20th. The Kubanka had purplish anthers, the Saxonica yellowish.

In the two plots in the garden the Saxonica was so much destroyed by the rust that a great many of the stalks which had come forward so luxuriantly never produced their ears at all. Gradually the rust began to attack the Kubanka also, so that all hope of making a quantitative comparison of results in the garden was at an end. But it seemed probable that in the station which had the best soil and exposure, the Kubanka, but for the rust, would have yielded a larger return than the Saxonica. It was not so largely damaged as the latter, nearly all the ears being allowed to carry their fruit to some degree of completion.

Whether the one form of Wheat is more liable to disease than the other, is a question of considerable evolutionary importance, which cannot be here answered. We have seen that in the present case the Saxonica was by much the more severely damaged by red-rust. In one Kubanka plant of four stalks all the ears were totally destroyed by smut (Ustilago segetum, Ditm.) In a plant of Saxonica of six stalks all the ears were also destroyed by smut, one ear only coming out of the sheath. On opening the other five sheaths the ears were all found a powdery mass of black dust. Whatever may be the mode of attack of the smut fungus, the ears are destroyed by it in their very earliest stages, probably in the embryo itself. It is hardly even a local disease; if the plant of Wheat, Barley, or Oats, has five or six stalks, it is extremely rare to find a case in which the ear of any one escapes.

Notwithstanding the great damage done to both sets of plants in the garden, a few kernels here and

there came to fair maturity. The ears of the Saxonica remained of about the same size as the ears I received; but in some of the best Kubanka ears the spikelets had three or four grains, in place of two as in all the original. I have already given the weight and size of the corns as received by me. The best corns of Kubanka which escaped the rust weigh .92 of a grain, being an increase of 39 per cent., while the best and most plump of the Saxonica weigh .57 of a grain, being an increase of 9 per cent. So that if size is any index of excellence, the grains produced here are better than in the Russian crop supplying the seed.

The row of plants in station three, growing surrounded by Oats, entirely escaped red-rust. The soil is a good Oat-growing soil, but not suitable for raising Wheat. The Oats were rather thick, so that every Wheat plant had a severe fight for his room. In only two cases of Saxonica was one seed able to throw up two culms. All the other plants had single stalks of small diameter, and smaller ears than the original, but exactly of the same type. Both sets came to fair maturity, and were pulled on September 14. No shedding of seed or breaking down of stalks had taken place. Only a very few grains had been eaten out of the pales by insects, and these have been allowed for in the comparison. When both parcels were perfectly air-dry the stalks were cut off close above their roots, and the following are the comparative facts :—

(3.) KUBANKA.

Of 115 seeds planted 89 grew, producing 89 stalks about 3½ feet high. The total weight was 1478 grains, giving an average weight to each stalk and ear of 16.61 grains. The weight of corn was 362 grains; of straw, 1116 grains; the corn being thus to the straw in the proportion of 100 to 308. The numbers of grains in the ears were as under :—

5	0	21	1	6	13	15	6	14	6	6	6	15	26
9	15	15	7	6	16	10	13	6	16	4	5	14	3
21	10	15	10	16	4	5	14	13	9	20	11	19	15
18	3	16	10	4	20	12	4	5	6	8	15	8	14
3	5	16	5	9	7	6	7	19	17	9	7	7	1
0	13	0	3	7	8	1	5	3	4	10	22	12	20
5	6	5	4	6									

—giving an average number of grains in 89 ears of 9.81.

SAXONICA.

Of 113 seeds planted 91 grew, producing 93 stalks about 3½ feet high. The total weight of straw and corn was 1910 grains, giving an average weight to each stalk and ear of 20.54 grains. The weight of corn was 519 grains; of straw, 1391 grains; the corn being thus to the straw in the proportion of 100 to 268. The numbers of seeds in the ears were—

2	13	14	6	30	17	2	11	17	15	9	15	24	21
18	15	8	4	7	24	25	5	12	21	14	0	0	14
8	32	22	17	16	16	22	11	26	20	4	21	6	19
27	2	1	8	12	21	18	9	25	17	20	8	21	5
14	11	6	6	5	16	7	0	13	20	8	10	23	7
19	18	14	5	24	12	1	16	21	20	22	21	1	6
17	1	7	14	17	23	15	0	9					

—giving an average number of grains in 93 ears of 13.39, and an average number of grains in 91 plants of 13.69.

In the question before us the items which are more or less important in the comparison of the two Wheats with each other may be tabulated as follows :—

	Weight of Stalk.	Weight of Grain per Ear.	Weight of Straw per Ear.	Average No. of Seeds per Plant.	Average No. of Seeds in 20 best Ears.	Ratio of Grain to Straw.	Average Weight of Seeds.	Weight of Best Seeds.
	Gr.	Gr.	Gr.				Gr.	Gr.
Saxonica .	20.54	5.58	14.96	13.69	23.80	100 : 268	.416	.5
Kubanka .	16.61	4.07	12.54	9.81	18.20	100 : 308	.415	.6

In such an experiment as this every seed can be followed from the time it is picked out of the ear and deposited in the ground to the time at which it expands into a full-grown and ripened plant. Where there is any room for doubt as to what variety of seed was sown the experiment loses all value. It can be confidently affirmed in the present case that the ears which grew from the Kubanka seeds had varied in nothing but size and colour from the Kubanka ears which supplied the seeds; the same being true of the Saxonica. The ears and seeds remain for examination; the plants from Kubanka seeds have not changed into the Saxonica form, nor have the plants from Saxonica seeds changed into the Kubanka form.

But although this experiment does not present an instance of transformation, it brings evolution before our eyes as the work of the current hour, by presenting us with what seems a clear example of the prevalence of the most prolific.

Until some further experiments have told their story I am not warranted in saying that the explanation of Dr. Asher must be abandoned, but at the present stage the following preliminary hypothesis is suggested by the above facts.

Fields are to be seen, we are told, in Samara and Saratoff, "with parts still Kubanka, and the remainder Saxonica;" and "there are no intermediate varieties; a grain produces a plant yielding either true Kubanka or true Saxonica." It thus appears that the crops are mixed crops of Kubanka and Saxonica, and that consequently the seed sown is mixed seed. The same is the case in all corn crops in all countries; and has been the case in all ages. Except in a few restricted instances, there is no such thing as a crop of Wheat, Barley, or Oats, exclusively of one variety. The housing and threshing of different varieties, in one barn or at one threshing-floor, is fatal to the perpetuation of pure varieties. And when varieties have been once mixed they can never be separated, except by systematically rearing a new stock from a single plant, and this is a work of scientific cultivation seldom engaged in, and soon obliterated.

It is seen from an experiment that the Saxonica form is more prolific on inferior Wheat land than the Kubanka. Had the red-rust not attacked the medium station, the produce of the Saxonica would have been three or four times as great as the produce of Kubanka, since the number of tillers on the Saxonica stocks was ultimately three or four times as great as on the Kubanka. On the station affording comparable results, the seed of Saxonica yields 13.69 returns, while the seed of Kubanka yields but 9.81. In other words, where the first seeding consists of 100 of each sort, the resulting crop consists of 100 Saxonica and seventy-two Kubanka. If next year this mixture is used as seed, the second crop will consist of 100 Saxonica and fifty-one Kubanka; the third crop of 100 Saxonica and thirty-six Kubanka, and so on; the proportion of Kubanka diminishing and the proportion of Saxonica increasing, till, to a casual observer, the whole of the Kubanka will appear to have changed into Saxonica. But there were in reality two forms to begin with; the more prolific has multiplied and the less prolific has proportionately decreased; but representatives of both still remain, and there are no intermediate forms because there has been no transformation.

The aspect of evolution thus presented is not that of transformation, but that of the extinction of the less prolific by the more prolific, of the weaker by the stronger. It is just because the one form of Wheat cannot readily change into the other that a struggle for predominance is possible. Without any change of form in a given flora an entire change of scene thus creeps over vegetation, presenting new kinds of animal food and giving physiological impulses new directions. Nor can there be any doubt that changes of form are much more slowly worked out than changes of flora. But with the altered vegetable soil, for example, arising from an incursion of dominant forms, new cosmical factors come into operation, and change of form may at length be the necessary resultant. Both processes are the harmonious details, the insensible steps of that great daily work going on before our eyes, which embraces the moulding of a plant and the making of a planet.
A. Stephen Wilson.

OUED EL KALIA, EL BIAR, ALGIERS.

(*Concluded from p.* 592.)

THE grounds attached to Lady Charleville's residence are in extent about 35 English acres, one-third of which is under plantations, which consist of Cypresses, Olives, Pines, and a low-growing evergreen Oak bearing large quantities of fine long acorns, similar to what I have often seen at home, and which were imported from Brazil for tanning purposes, and a large variety of other low-growing plants calling for no special notice, and which form the undergrowth.

The carriage-road from the entrance-gates is quite a zig zag, this form being necessary to reach the residence, which is still higher up than the entrance-gates. The carriage road is, therefore, in three tiers, one above the other, on the sloping hill which faces the south. On either side of these tiers of road there are broad borders for shrubs at the back and flowers in front, which are well planted at back with Cypresses, Junipers, Carobs, Peppers, Neriums, or Oleanders, Japan Medlars, and other suitable things; while the edgings of the borders are all done in a good thick bank, 18 inches deep, of Ivies, and inside this are growing the various sorts of Pelargoniums—big bushes—which were in full blossom at Christmas time, mixed with other things, as Roses, annuals, &c., and with large clusters of a herbaceous Gladiolus plant, common here in this place, which blooms in January, when it sends up its long reddish-coloured spikes, so beautiful and useful for vases, &c.

Inside an enclosure, and attached to the residence, and to which the carriage road now described leads, is made a nice little flower garden, which is on raised ground, and overlooked from a terrace walk which leads to the drawing-room. The garden is a long square, surrounded by the courtyard wall. On the walls and wire trellises are a varied lot of climbers, such as Bougainvillea, Bignonia capensis, both of which were laden with masses of bloom at Christmas; three or four other beautiful Bignonias, Plumbago capensis, Tacsonias, Passifloras, Lantanas, Mandevillas, and amongst which are climbing Roses, Teas and Noisettes, which do so well here. In the beds are planted dwarf Palms, Strelitzias, Dracænas, Yuccas, and Brugmansias, the Bignonia capensis, and Poinsettias, with Bananas, Oranges and Lemons, and Peppers, planted in suitable points of the garden walks. Amongst these, to the front of the beds, are planted Pelargoniums, Fuchsias, Cinerarias, herbaceous Calceolarias, Linum trigynum, Violas, Mignonette, and Sweet Peas. Here in this enclosure on gravel are some good specimens of Ficus elastica and F. Roxburghii, 20 feet high.

The grounds are beautifully undulated. A well-kept walk is planted on one side with Eucalyptus of sorts, some 50 feet high, and on the other with noble-looking specimens of Japan Medlars, some 8 feet high by 6 feet through. This walk, over a quarter of a mile long, leads from the residence, and descends between two sloping hilly surfaces to the valley below. In passing down this winding walk you pass a square walled-in enclosure, in which the gardener's cottage is situated. It is on the sloping ground, and the walled enclosure is surrounded by gigantic Prickly Pears and Agaves, with their bristling spines setting the intruder at defiance.

At the end of this walk in the valley there is enough ground on the level and by the side of the ravine and little trickling stream for gardens, and it is here you find yourself on looking up surrounded with mountain-like hills. In this situation there are flower gardens and vegetable ground, the flower garden at one end with various shaped beds, edged in many instances with Rosemary and with tiles. In these beds are Bamboos, Bananas, Palms, Japan Medlars, and splendid Roses and Pelargoniums in full bloom at Christmas—and such Tea Roses! and climbing over and through many trees and shrubs are to be seen the splendid Bignonias and white Clematises, &c.

At the other end of this flat ground is the Orange grove, and vegetables are grown underneath them. Here there are something like 200 Orange and Lemon trees, which with their heavy crops in December present to the observer for the first time such a sight as is not easily forgotten — large grown Citrons, fine St. Michael Oranges, and last, but not least, the sweet little Mandarin. This is an enjoyable place at which to spend an hour or two at Christmas time, with the shade over you and water by your side, and with the ground on which you tread at a temperature of 60°, and the atmosphere around you at 70°, and the well-furnished hills in view, and close enough to you to make you enjoy the situation. The Orange ground and vegetable plots here are irrigated during summer, but there are large breadths of Potatos and Peas, Turnips, Carrots, and Artichokes, on the slopes which are referred to above as touching the long descending walk, and these do not get water by that means.

In the grounds on the slopes are great numbers of Fig trees and Mulberry trees, white and red, which, when seen in full foliage, must look very well. Some are 25 feet high, and are dotted about on the sloping bank, and bear, I was informed, heavy crops of fruit. There are also Pomegranates, Almond, Peach, Nectarine, and Apricot trees—some large standard trees, but not very many of the latter three fruits.

Large plots of Peas, Beans, and Potatos are grown here, and good supplies of them were being furnished through December, and largely increasing in January; also splendid Cauliflowers, Turnips, Carrots,