

ON CROSS-BREEDING PELARGONIUMS.—No. I.

THE artificial fertilization and propagation from seed of the Scarlet Pelargonium, to obtain new and improved varieties—the last division of my subject—I had hoped to have been able to have treated upon in one paper, but I find it to be too comprehensive to admit of justice being done to it within the limits of my previous contributions, and I must therefore subdivide it. An exhaustive article upon the hybridization of the Pelargonium family would contain so many points of interest, and subjects for theoretical discussion, that a volume would scarcely contain it; therefore I purpose to confine my remarks to artificial fertilization, and to adhere closely to the practical part of the subject, giving only the results of my observations, which I hope may be useful to others carrying on similar experiments.

Presuming that I am addressing myself to the amateur, and probably to the novice, in cross-breeding, I purpose giving in detail the method I adopt. In the first place, then, I would urge upon all who undertake even so trivial a work as the fertilization of a flower, to do it with method and preconceived design, to note the means employed with scientific precision, and to observe with accuracy the results; for should the data and experience so obtained prove of no ulterior value, they will, at any rate, afford many a useful hint to the manipulator for his onward guidance, and immensely enhance the pleasure as well as the interest of his undertaking.

To commence breeding for new varieties of the Pelargonium, whether for foliage or flower, the first thing requisite is to possess the best varieties for the purpose. In my former papers I have endeavoured to indicate those varieties which in each class I considered the best, at the same time pointing out their qualities and deficiencies, also giving my idea of the improvements desirable to be attained. But I would have every one form his own ideal standard of perfection, and aim to attain to it.

The next requisites are the tools to work with. I use a stool of convenient height on which to place the plant to be operated upon, and a small wooden tray with divisions, containing a fairly powerful magnifier (I employ the eye-piece of an old microscope), a narrow-bladed, sharp-pointed knife, fixed in a long, narrow bone handle, a pair of sharp-pointed (grape) scissors, a small pair of sharp-pointed, well-adjusted forceps, a kind of straight blow-pipe, an old-fashioned watch-glass, two or three camel-hair pencils, a few tiny bottles fitted with air-tight corks, a number of small slips of white card, pierced at one end with a piece of fine wire two inches long passed through and secured by a twist, a number of small squares of white demy paper, four note-books, and a lead pencil.

I will now suppose that I have decided upon crossing two plants for an ideal result, and that the mother or intended seed-bearer is before me, and my tools at hand. I first proceed to emasculate the pip or pips whose corollas have expanded, by removing the stamens by means of my sharp-pointed knife, taking

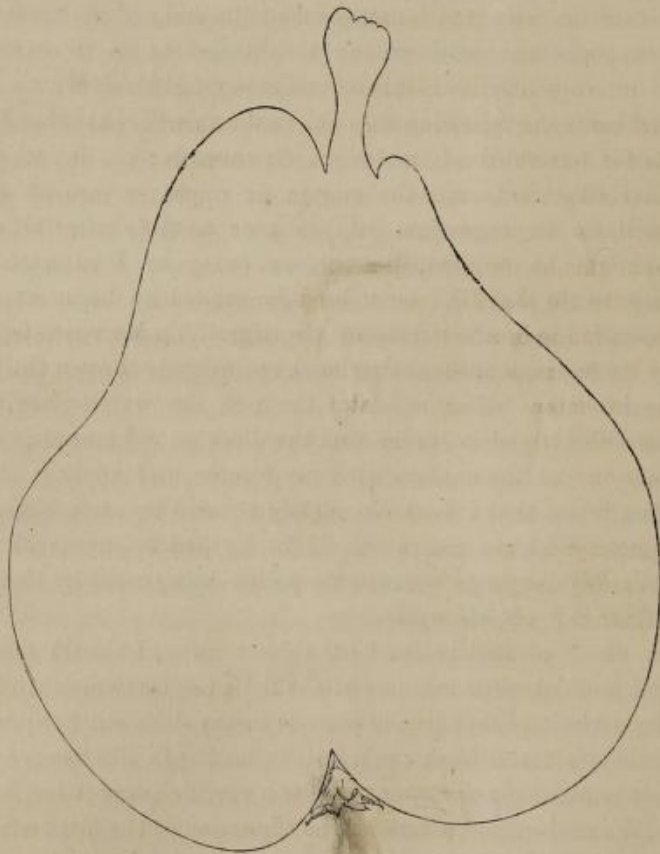
care not to injure the pistil; this should be done before the pollen-sacs burst, if possible, but certainly before the pistil has become expanded. Should the pollen have been thrown out, it will be necessary to remove every grain that may be scattered by means of a camel-hair brush; to make doubly sure, I also blow violently through the blow-pipe direct upon the pistil. I then examine the pip with my glass, to see if I have thoroughly effected my object. My next proceeding would be to enter in note-book No. 1 (under number) the name of the plant, viz., the seed-bearer, also that of the intended father or pollen plant, together with a remark as to the result I expect to be produced; I then take one of the little slips of card, and pencil upon it the corresponding number to my entry, and with one twist of the wire it is fastened round the stalk of the truss.

I have supposed the pistil up to this period to be an erect and straight column, and consequently incapable of receiving fertilization; by the morrow, or perhaps not until the following day, this column will have become split into five segments for one-third of its length downwards; or, in other words, the pistil will have expanded, and the stigma or upper surface of each segment presented itself for impregnation. As soon as possible after this takes place the pollen should be applied, but before doing so I examine the stigma with my glass, to see that I have not been forestalled by insect intervention, and that the stigma is in a perfect state of virginity. My next step is to detach, by means of my knife, some anthers that have recently thrown out their pollen from a pip of the intended father, catching them in the watch-glass, which should have been carefully wiped to ensure that there are no remains of previous pollen; I then take up one of the anthers with my forceps and apply it to the stigma, using the glass to see that I have completely covered its surface with the pollen. Some recommend that the pollen should be applied by means of a camel-hair pencil, but there is danger of extraneous pollen being used by this method, and hence I consider it is objectionable.

If I am short of the pollen I have been using, I should put any surplus anthers that I had detached into one of the little bottles (which must be perfectly clean and dry), carefully cork it, and place it in the dark until required; but this pollen I should not use, if fresh could be obtained. In like manner I should endeavour to economize a pip or flower that I was very desirous of fertilizing. If, for instance, a day's neglect had permitted the expansion of the pistil with the anthers not removed, in which case the pollen-sacs would have burst, I should direct a sharp blast through the blow-pipe on the centre of the pistil. By this means I generally succeed in sending the anthers and pollen flying without danger of fertilizing the pistil; but if upon examination I find a grain of the pollen has found its way to the stigma, I at once remove that pip with my scissors.

In most of the varieties of the *Pelargonium* the anthers burst and fall off prior to the expansion of the pistil, or the pistil stands up above and expands over the falling stamens, and consequently does not become impregnated except by some foreign agency; but there are some varieties, especially those with petals

of a pink colour, or which possess weakly constitutions, where the pistil expands as soon as or even before the pollen-bag bursts, and in which also the pistil is frequently short, so that when it expands it is smothered as it were by the bursting anthers; these varieties are great seeders, each pip being fertilized by its own pollen. I would instance Christine as an example of this fact. I find bright, clear weather, and the hours of sunshine conducive to fertilization. If the pollen and the stigma were alike in a condition to impart and receive fertilization, the effects will in most varieties very shortly be manifested, by the falling of the petals of the fertilized pip.—JOHN DENNY, *Stoke Newington*.



ROBERT HOGG PEAR.

THIS fine melting Pear was introduced by me in 1869 from Angers, France, where it was raised by the eminent pomologist André Leroy. It fruited for the first time in 1868, and was named by him in honour of our greatest British pomologist, Dr. Hogg, and certainly does honour to both. It fruited here this season, but only two fruits came to maturity, and one of these got bird-pecked, and rotted before it was quite ripe. The other, from which the sketch and description were made, was a handsome and delicious fruit; rather above the second size, and of first quality. It was ripe the 20th of November.