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THE
Gardeners' Chronicle.

SATURDAY, FEBRUARY 9, 1895.

THE EDUCATION OF GARDENERS.

IT would certainly not be difficult to name men of eminence as gardeners, who, before they entered the bothy, had no education beyond that of the primary school. They have acquired their practical knowledge in the only school in which it can be obtained—that of practical experience; and, so far as they have at all supplemented this practical knowledge by learning the scientific principles that underlie its rules of thumb, they have only been able to do so by laboriously up-hill processes of self-tuition in the intervals of a busy life. It must, however, be borne in mind that in the case of many such gardeners, the primary school in question was across the Border, where primary education has long been far more complete than with us.

It would, on the other hand, we may safely say, be impossible to find one of these self-taught men of eminence who does not regret that he had not greater educational facilities in his youth. Taking a rational view of all the circumstances of the profession as they are, it is of little use to indulge in Utopian dreams of advanced education for all gardeners. That can at most apply only to a future generation; but it is well worth while to consider what practical steps might be taken in this direction at the present time. In doing so, we ought to bear in mind the requirements of those who have already started in their career, as well as of those who have their time before them. What seems to be wanted is, firstly, a sound rudimentary training in "the three R's," necessary for all children alike, which need not occupy them beyond their ninth year; secondly, continuation schools, in which a certain degree of specialisation is desirable, which should occupy all a boy's time until he is thirteen, fourteen, or even fifteen; and thirdly, a systematic curriculum of classes which can be attended by any after those ages, whilst engaged in practical work.

THE PRIMARY SCHOOL.

If parents sincerely wish their children to succeed in after life, they will certainly do their best to secure for them a sound grounding in those elementary subjects that are essential to all: they will send them to school early and regularly; and they will not be anxious to remove them prematurely. If our primary schools, on the other hand, are not hopelessly understaffed and inefficient, any sane child sent to them at six years old ought to be able to read and speak its own language distinctly and with ease, to write legibly, and to understand at least the first four rules of arithmetic before it is nine years old. As these are essential subjects they are here mentioned alone, without any reference to object-lessons or kindergarten exercises, which may be most valuable in training the eye to observe, and the hand to manipulate, but which should supplement, and can in no wise take the place of, the "three R's."

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THE CONTINUATION SCHOOL.

So far, no special training is requisite for the future gardener, nor is there any special call for effort or self-denial on the part of his parent in securing an education for him. After the boy has acquired the barest rudiments of an education, however, and still more when he reaches an age at which he might legally be wholly or in part removed from school, the time comes when his parents must expect to have to make some sacrifice. A boy intended for an occupation which has a scientific basis ought to be kept at school entirely until he is at least fourteen. During these five years, from nine to fourteen, there are many subjects which the future gardener should learn in common with all other boys, and several others less "generally necessary to" education. It is not necessary that he should add to his arithmetic what has been called "the low cunning of algebra;" but it is necessary that he should learn how to keep accounts, i.e., what is called compound addition, subtraction, multiplication and division, and perhaps also the elements of book-keeping.

Desirable as it is that every good citizen should know something of the history of his country, it is far more important for the budding horticulturist to get a good knowledge of geography. If this subject be well taught, he should get a clear grasp of the climatic characters of the various countries of the world, and of the general features of their vegetation, to say nothing of means of transport, trade routes, and merely political matters.

Then, again, though neither an acquaintance with French nor German, and still less Greek, is essential, it is at least highly desirable that he should learn some Latin, considering the large part that language still plays in matters botanical. So, too, though he need not master Euclid's *Elements of Geometry*, it is most important that he should—as should every boy and girl—learn to draw. Some knowledge of geometrical drawing, the making of plans, and the use of surveying instruments, will be of the greatest practical value to him in after life, and these subjects are not difficult or expensive to introduce into any school curriculum, though it may at present be necessary in some cases in these subjects, and in some of those yet to be mentioned, to supplement the wide powers of our primary school teachers by some kind of peripatetic specialists.

Though, from motives of economy of both time and money, we have confined our ideal curriculum to subjects of practical utility and not merely of educational value, it is now agreed by all our leading authorities that, educationally no less than practically, some science should find a place in all elementary schools. Some considerable experience as a teacher has convinced the present writer that this introduction to science should advance from the necessarily disconnected object-lessons of the kindergarten stage to an exposition of connected general principles rather than to the separate catechetical study of the facts of various departments of science. In other words, I think connected lessons on what has of late years been called in this country "physiography," preferable to such a miniature encyclopædia of facts as M. Paul Bert's *First Year of Scientific Knowledge*. A skilful teacher can find means to impart sound conceptions of scientific methods of exact observation and inference, such as are clearly set out in Prof. Huxley's *Introductory Primer*. The constitution and various states of matter, the mechanical powers, the various forms of energy, the nature of the chemical elements, the principles that underlie much of the sciences of heat, chemistry, meteorology, and even geology, and many of the simpler instruments used in those sciences, can, by the use of numerous familiar illustrative examples, as is done in Ganot's *Popular Natural Philosophy*, be made intelligible to any boy between twelve and fourteen. There is no reason why every boy at the latter age should not understand the principles of a lever, a pulley, a thermometer, a barometer, a pump, and a still, and know something of the chemistry of air and water, and of the formation of soils.

But while the education of every boy would be the better for the introduction into it at this stage of some physiography, he who is to be a gardener should have in addition some insight into elementary biology or natural history. It is not by any means essential that he should learn much as to the anatomy of a frog or a crayfish; but it is important that he should know something of the action of green plants on the air, the chemical requirements of plants in the way of food, the essentials for the germination of seed, the processes of nutrition and seed-production, the relation of parasites and saprophytes to green plants, and of plants to animals. In other words, what he requires is general physiology, and some vegetable anatomy. It will, of course be easier to obtain specimens and to illustrate this subject in the country than in large towns; but there is no insuperable difficulty in teaching any of the subjects we have discussed so far, in a town school.

It may be a matter of surprise to some that no mention has hitherto been made of the study of botany. It is, of course, desirable for a gardener to acquire as full and detailed a knowledge of this science in all its branches, as his circumstances permit. A gardener must, in fact, necessarily be a student of botany throughout his career. The questions remain, "how and when shall he begin this study?" It is of the utmost importance that every step in his advancing knowledge of this scientific basis of his life's work should be planted firmly on the sure basis of fact—in other words, that his botanical training should be essentially practical, gained from the study of plants rather than, or at least before, the study of books. Here comes in, with far greater force than in the question of elementary biology, the advantage of country training over that in towns.

It is difficult to maintain strict class-discipline in the open air, and it is important in no way to repel the young student from the scientific aspect of his work. For these reasons I strongly incline to the plan adopted with such signal success by the late Professor J. S. Henlow at Hitcham, of making botany an out-of-school or recreation study—at least, at the outset.

I have found it possible to teach many of the distinctive characters of leaves and flowers to children of five or six years old; but, judging from some of the Hitcham specimens given me by the Rev. George Henlow, most of his father's pupils who actually collected, preserved, and named plants, were about eleven or twelve. Between this age and the time of leaving school an immense amount of valuable information on plant life, on the relations of plants to soil and to animals, and on the characters used in discriminating plants, can be imparted by a competent and enthusiastic teacher. G. S. Boulger.

(To be continued.)

NEW OR NOTEWORTHY PLANTS.

CYPRIPEDIUM WOLTERIANUM, *Krzl.*, n. sp. *

The leaves are bright green above, with very slightly darker hieroglyphic markings and tessellations. The scape is about 1 foot high, brownish and covered with grey hairs. The two bracts are very

* *Cypripedium Wolterianum*, n. sp. (*C. Lowii*, Lindley affine).—Sepalo dorsali ovato acuto cucullato dorso carinato margine præsertim basin versus reflexo, apice inflexo læte viridi, margine albo, linea mediana in ipsa basi brunnea; sepalo inferiore ovato acuto quam labello fere duplo brevioro albido-viridi; petalis obovato-oblongis acutis leviter deflexis margine omnino nec undulatis, nec ciliatis, basin versus supra viridi-brunneis papulis nigro-purpureis pone marginem superiorem punctulisque purpureis crebris, dimidio inferiore læte viridi, a medio apicem usque pallide purpureis; labello pro floribus magnitudinis magno, margine basilari utrinque contiguis, papulis nitidis instructo, gales labelli pone orificium utrinque acutangulo, toto labello omnino pallide purpureo-brunneo infra et postice pallidioro, infra densissime purpureo-punctulato; gynostemio minuto; staminodio supra bipartito infra v. antice late emarginato, umbone in denticulum interpositum elongato; toto gynostemio viridi margine albo (nec marmorato). Flores 12 cm. lati, 8–9 cm. alti, folia lanceolata supra vix reticulata infra pallide-viridia. D. Wolter, Magdeburgensi diatum.—*F. Kränzlin*.

different in size, and much shorter than the long, brownish-purple ovary. The dorsal sepal is ovate-acute, somewhat hood-shaped. The apex is bent forward and downward. In the shape of this sepal our species represents a quite new type in *Cypripeds*. The colour is a very beautiful tint of green, with a broad white border. The inferior sepal is pale whitish-green, half as long as the lip, and of particular interest. The petals prove the great resemblance it bears to *Cypripedium Lowii* in shape and general appearance, but the colour of the basal region is quite different. They have not the large purplish-black spots of *Cypripedium Lowii*, but in the upper margin the brownish warts are like those of *Cypripedium barbatum*, but without the hairs, and with numerous purplish dots on the disc; whilst the inferior half of the petals is bright green, without any markings.

The lip is rather large for the size of the flower. It has converging borders to the basal part, with small shining warts, and very acute side-lobes; the general colour is purplish-brown (more dirty-purplish than brown), paler behind and below, with numerous very small purple dots. The column has a staminode quite different from that of *C. Lowii*; it is oblong-obcordate, with a tooth in the sinus, but without the erect and hairy horn of *C. Lowii*; its colour is green, with a white border. The whole flower is quite destitute of hairs and cilia, and entirely glabrous. In short, the plant resembles *C. Lowii* in general appearance, but differs principally in its smaller inferior sepal, in the colour of the basal part of the petals, in its entirely different staminode, and in its smoothness.

It is perhaps a natural hybrid between *C. Lowii* and another parent unknown to us. The staminode, however, shows such a peculiar feature, and is so dissimilar to this organ in other *Cypripediums*, that we must consider the plant for the moment as a true species. The habitat is to be kept secret for the present, but I can assert that it is not the native country of *Cypripedium Lowii*. For myself, I was struck by the information given to me by the importer. The flowers have all the grace of those of *Cypripedium Lowii*, and are of about the same size. I may add that the specimen which flowered at Magdeburg, in M. T. Wolter's collection was a very poor one, yet its flowers were in size and beauty equal to those of a normal *C. Lowii*. It is to be hoped that the flower will increase in beauty when the plant has acquired more strength. The artificial hybrids of *C. Lowii*, viz., *C. calanthum*, Rehb. f. (*C. barbatum* Crossi × *Lowii*), and *C. macropterum*, Rehb. f. (*C. Lowii* × *superbiens*), are not identical, the latter being perhaps similar in many respects. *F. Kränzlin*.

GREENHOUSE HARD-WOODED PLANTS.

(Continued from p. 70.)

MYRTUS.—Although in the more favoured and sunny districts of the south, and further north where the warm influence of the Gulf Stream is markedly felt, the Myrtle may be safely grown against warm walls and even as bushes, it is safer to recognise them as greenhouse plants. Save in the point of less pruning being required by the plant, the culture is similar to that which is found to suit the *Polygala*, except that the form of the plant must be regulated by stopping the strong shoots, and water afforded more freely during the summer. A full exposure to sunshine is needed in order to secure a good display of blossoms. For growing into a large specimen plant, *M. communis* is no doubt the best, more particularly if a standard is required; but if dwarfier and compacter plants are preferred then I would select *M. angustifolia* or the Box-leaved Myrtle—this variety will in warm positions make handsome dwarf bushes or small pyramids which will flower profusely during the autumn. Further south than London I used to grow both of these varieties on walls; the only protection needed by them in winter was supplied by placing mats over them when the frosts became severe. *Myrtus Ugni*, or as it used to be called, *Eugenia Ugni*, is grown