The simple principles of light and shade as shown by contrast, reflected light, aerial perspective, tone and texture in connection with monochrome objects.

The same, as exemplified in groups of objects which differ considerably in color.

Water color painting from objects.

Drawing and shading a head from the antique in chalk.

The simple principles of surface decoration.

Many pupils could only, as teaching is at present, obtain the broad outline and general principles of such a course as this. With the getting of so much, come the aforesaid educational advantages, such skill as is useful to everybody, and that intelligent knowledge of the rudiments of art work which increases the power of appreciating works of art. The designer and the artist have too long been hampered by the want of knowledge on the part of the public. Cultivate the taste of every boy and girl, and it will become much easier for the art worker to travel beyond the beaten track of obvious and commonplace conventionality.

Some pupils, with fair talent, will obtain that amount of skill which is the necessary preliminary step to the technical drawing of various professions and industries. Medical students who cannot draw are found to be heavily handicapped in competition with those who can.

It is unnecessary to mention the requirements of architects, engineers, and the like. The individual who can draw with ease and accuracy can gain skill in any kind of manual industry much more quickly than would be possible without such power. The drawing of an object is an excellent preliminary to the making of the same. The acquirement of accuracy in measurement produces habits of precision that directly lead up to skillful handicraft. The difference between the skillful and unskillful workman is mainly that the former fashions his products the exact size required, and the latter makes them wholly or in part too big or too little for their purpose, and so wastes time and material for which the employer pays. It has been said that nine-tenths of the English workmen cannot understand a plan, elevation, or section. Waiting for the foreman's explanation increases the cost of production by wasting the workman's time.

Pupils who have decided talent for pictorial representation will lay a foundation upon which to build up, on leaving school, a thorough-going training in drawing and painting, such as will enable them to truthfully represent whatever is placed before them. So much power every artist should have as a preliminary to the painting of pictures. Poets, authors, musicians, dramatists, and painters all have a tale to tell, and each tells it in a way most suited to his faculties. We do not ask the poet to present his subject as an oratorio, nor the dramatist to develop his ideas with a palette and brush. We do expect a man, when he has chosen by what means he will introduce his theme, to show acquaintance with and skill in the use of the medium of his choice. Indeed, so much is such skill appreciated that many works of art support a reputation, not on account of the subject, but because of the technical skill displayed. There are pictures that delight artists, and no one else.

For nine years I was in charge of the art department of the Bradford Grammar School, and for six years of that time I also taught at the Bradford Girls' Grammar School. During this period the pupils had to begin the study of drawing by the exclusive practice of what is often spoken of as freehand. By various devices I strove to awaken and sustain an interest in its practice, but with indifferent success. It is wearisome to clever pupils because it requires so little intellectual effort, and uninteresting to the ordinary boy or girl. The process of lining in, however necessary for professional designers, chromo-lithographers, or engravers, cultivates in the young an unfeeling, mechanical method of dealing with a sketch which proves destructive of its best qualities. Those who have had long preliminary practice in the lining in of freehand acquire a habit which is most pernicious, and difficult to get rid of in after studies. Why should decorative or conventional arrangements of plants be given to a child before it has any power of drawing natural plant form itself? As in other educational matters, the proper way is to proceed from the known to the unknown. Our first lessons in drawing should be from things familiar and interesting.

Curiously enough, when I was asked, on my coming to London, to visit a number of High Schools, in order to find out why the drawing languished, I found the excessive practice of freehand was the chief cause of the mischief. I quote the written opinion of the head of a school as showing the general experience: "The continual practice of freehand is decidedly cramping to the pupils, and gives them a distaste for drawing." On receiving this confirmation of my own experience, it became a duty to devise a method of teaching drawing entirely free from objects. This system has met an acknowledged want in so far as is shown by the fact that many schools are working according to it, and from other schools in different parts of the country inquiries are frequently received.

The exhibition just closed at Lytham House, St. Alban's road, Kensington, showed how it is being worked in the schools of the Girls' Public Day School Company.

Some of the drawings exhibited in this and previous years are on the walls.

A most important point to remember is that these drawings are entirely the work of school girls. The teacher has not assisted in the manipulation or mechanical execution of them, but has been strictly limited to giving advice.

The characteristics of the annual exhibition are as follows:

1. Each school sends a certain number of careful drawings, illustrative of the work of the six divisions.
2. No pupil may send more than one drawing.
3. The drawings are certified by the head mistress as being the unaided work of the pupils themselves.

There is also an annual examination, the main features of which are as follows:

1. The teacher's power of giving a class or collective lesson is tested.
2. There is a succession of easy stages, one of which can be mastered each year by an average pupil.
3. Special provision has been made for talented pupils by the introduction of an honors paper in each of the divisions.

It may be well to state the aim of the work of each division, beginning with the most elementary.

Division I.

1. To develop accurate observation.
2. Connect writing and drawing.
3. Ward off color blindness.
4. Cultivate the perceptions.
5. Teach outline drawing from *real objects*, which present no difficulties in foreshortening.

Division II.

1. To call attention to the difference between the real and apparent form of simple objects and curves.
2. To cultivate the graphic memory.
3. By the *dictated drawing* to insure a knowledge of art terms, and give facility in working from verbal instructions.

Division III.

To teach the leading principles of drawing in outline the apparent form of the things of every day life.

Division IV.

To develop a useful power in drawing from rounded objects (plants and casts), that will serve as a stepping stone between drawing from simple objects and drawing from the antique.

Division V.

To give a knowledge of shading from real things. This will materially assist the pupil in acquiring the principles of painting.

Division VI.

To enable those who have shown capacity sufficient to pass the aforesaid divisions to begin the study of the higher branches of art.

It may be mentioned that a pupil in one of the schools had a picture hung in the Royal Academy at the same time that she passed in Division VI. of the course just sketched. This picture was painted in the afternoon class of the school by an ordinary schoolgirl.

Many of those present may take interest in the teaching of drawing sufficient to induce them to read the various speeches and paragraphs which appear in the daily papers respecting the advantages of introducing it into schools. Many may also have noticed how slowly we move in such matters in England. It would not be far wide of the mark to say that the teaching of drawing in nine-tenths of our higher schools is simply a farce when compared with the teaching of the other subjects.

The late Right Hon. W. E. Forster once said that the English people had a way of being late in every new educational movement, but that we generally managed not to be too late. We are certainly late in the matter of teaching drawing.

It is said by some that Englishmen are wanting in artistic feeling, and that it is no use wasting an art education on them; and others go so far as to say nothing can be hoped for in our climate. Yet we stand first in landscape painting, and in painting in water colors we are still without an equal. Can the descendants of the men who built our cathedrals be without art feeling? When England and its rivals have reached that stage in educational development when nothing that can be done is left undone, then those qualities of invention and imagination which have given such diversity to our school of painting will enable us to carry off the palm.

If I have succeeded in making clear the importance to general education of teaching drawing to every boy and girl, it is to be hoped that fewer in the future will have to go through the world without the aid of that marvelous descriptive power which it affords.

The capacities of the young are a mine of wealth from which it is to our interest to extract the ore. The faculties which are chiefly exercised in drawing can be developed easily in childhood, but with difficulty in adults. Let it not be said of us that we refused to work a vein of precious metal until all chance of working it successfully had passed away, for there can be nothing more depressing to a parent or teacher than that a boy or girl should, in after life, be able to point out wasted hours and wasted opportunities of school life.

THE PARALYSES.*

By J. T. O'CONNOR, M.D., New York.

GENTLEMEN: If on your way to college to-day you had overheard some passer-by say that a friend had been paralyzed, the word "paralyzed" would have conveyed no real meaning to you if you know anything of the subject. The ordinary non-medical person who hears the word used has, very likely, the idea that it means complete loss of muscular power, and the medical student does not need to go very far in his studies of physiology and anatomy to know that the word "paralysis" by itself may be applied to any one of half a dozen different conditions.

We will use the term to indicate a loss of nerve function in nerves distributed to muscles, although it is applied where the loss of function involves a nerve which carries impulses to secreting organs, and also nerves transmitting sensory impulses. In the latter case, however, the term *anæsthesia* is more suitable. You know from your studies of the past two years that one set of muscles supplied by one definite nerve may be useless to the individual, owing to a lesion in that nerve, or that one set of muscles not innervated by one nerve, yet having one combined physiological action, may be useless, as in paralysis of the anterior tibial or the peroneal group of muscles, the lesion in this case existing in certain aggregations of large ganglion cells in the anterior gray horns of the spinal cord. Here, then, are two cases in which groups of muscles may be useless, and yet the paralysis in the one case is to be differentiated from that in the other.

Then again there may be paralysis of one limb as a whole. This is of cerebral origin. But a paralysis of many muscles of one arm, especially in its upper part, is seen now and then. It is known as Erb's paralysis, and occurs in infants, and is caused by pressure made, during delivery, upon the brachial plexus, just above the clavicle. Such a paralysis may be mistaken for complete paralysis of the limb.

* Being the introductory in a course of lectures on the symptoms of nervous diseases, given to the senior class of the New York Homeopathic Medical College, beginning January 9, 1888.—*Mahmoudian Monthly*.

Paralysis of arm and leg of the same side is due to a lesion in the brain, in the motor areas for arm and leg in the cortex of the hemisphere of the opposite side. It is possible for an injury to one side of the cord in the upper cervical region to result in such paralysis, but there will then be something else—the sensations from the other side of the body will be impaired or lost. A knife thrust could thus injure one lateral half of the cord without injuring the other, but a disease process, such as myelitis, is not thus limited.

Facial paralysis is of two types. In the one known as Bell's palsy, the lesion is in the trunk of the nerve after it has emerged from the brain at the lower border of the pons. In this case all three branches of distribution of the nerve are paralyzed, the affected side of the face drops, the naso-labial fold is smoothed out, the patient cannot draw up the affected side of the mouth nor wrinkle the affected side of the forehead, while the distinctive feature of this form of paralysis is the inability to close the eye of the affected side—it stands open even during sleep, and the instinctive closure of the lids against foreign bodies is lost.

The cerebral type of facial paralysis, whether alone or as part of a hemiplegia, has the same symptoms, except that the eyelid is not affected nor the frontalis muscle. In this case the upper branch of the facial nerve has somehow escaped. But how? This has long been a puzzle to neurologists. It has been supposed that, on both sides, the eyelids and frontalis muscles were innervated from both halves of the brain equally, or that there was a separate undiscovered nucleus on each side for the nerve fibers to these parts. When the nucleus of the seventh nerve, below the floor of the fourth ventricle, is destroyed, as it sometimes is, by disease, the eyelid and frontalis muscle escape, and I am not aware of any case of nuclear disease in which the eyelid could not be closed. The experiments of Mendel shed some light on the subject. He has shown that in the guinea pig and rabbit, when the young animal is deprived of the upper eyelid and frontalis muscle of one side, the wound allowed to heal and the animal kept until maturity, there is found upon post-mortem examination no degeneration of the facial nucleus; but there is positive and great degeneration of the posterior part of the nucleus of the third nerve, below the aqueduct of Sylvius. This, then, accounts for the clinical facts as we find them in man, and we can now readily understand that even in degenerative conditions in the whole of the third nerve nucleus we ought not to see the open eyelid of Bell's palsy, for the muscle that keeps it open (the levator palpebræ) is powerless, together with all the muscles innervated by the third nerve.

You have heard me use the terms motor area of cortex, nucleus of nerve origin, and nerve trunk—all in connection with the idea of paralysis. A word or two of explanation may be of service here. It is a law of the construction of the nervous system that an impulse from or to the cortex does not pass through a continuous fiber, but that there is interpolated somewhere in the pathway of transmission a nerve cell. This is very readily seen in the motor tract and in the tracts of the cranial nerves. The motor tract arises by prolongation of the axis cylinder process from each ganglion cell of the motor cortical area. The fibers, appearing white *en masse* from the presence of the myeline sheath, make up at first a part of the centrum semiovale, then converge into the internal capsule lying between the lenticular nucleus on the outside and the caudate nucleus and the optic thalamus on the inside. At the base of the brain they emerge in the crus, occupying the middle third of its pes, then passing into the pons they are separated, possibly ending there in part. At the beginning of the lower third of the pons the fibers from the cortical motor area for the face cross over the median line and end in large nerve cells found in that portion. This aggregation of cells we know as the nucleus of the facial nerve. From its cells new fibers arise to emerge at the lower border of the pons as the trunk of that nerve. The fibers for the upper facial distribution have probably come down from the posterior part of the third nerve nucleus by way of the posterior longitudinal bundle to join the fibers from the nucleus of the seventh.

Now, another word or two of explanation. It is known that when a nerve fiber is cut across, only a part of it undergoes degeneration, that is, the part cut off from its source of nutrition. At first consideration we might think that the peripheral portion would degenerate, but this is not always so, for some tracts of nerve fibers degenerate upward after injury along their course. Without going deeper into the physiological and anatomical details, I may say that degeneration usually occurs in the direction in which the fiber transmits impulses, and extends to the end of the fiber. Thus, in the motor tract a lesion anywhere will be followed by this secondary degeneration, whether the lesion be situated in the cortical motor area, the centrum semiovale, the internal capsule, the crus, the pons, or the spinal cord, the degeneration extending downward and ending with the termination of the fiber, that is, at its junction with a large motor cell in the anterior gray horn of the cord. We are thus furnished with a very important aid in diagnosing a paralysis due to a lesion in the central half of the motor tract, that is, between the cortex and the ganglion cells in the anterior horn of the cord, from one due to a lesion in the peripheral half of the motor tract, that is, between the ganglion cells in the anterior gray horns of the cord and the periphery. Thus we see that the nutrition of the fiber in the central half is received from the cell of the cortex, but in the peripheral half it is from the large cell in the anterior gray horn.

In the sensory fibers of the spinal nerves the matter is not so readily understood. You know that these nerves emerge from the cord in two divisions or roots, an anterior, or motor, and a posterior, or sensory, and at some distance from their emergence the two roots unite to form one trunk. Now, upon the posterior root, before it joins the anterior, is a large aggregation of cells, forming what is known as the posterior spinal ganglion. The cells of this ganglion have something to do with the nutrition of the sensory fibers, but exactly what we do not as yet know. When a peripheral nerve is cut across, all of its motor fibers degenerate from the point of section outward, and this is so too of the sensory fibers, but the portion of the latter in connection with the posterior spinal ganglion is still nourished. If the sensory root is cut across between the ganglion and the cord, the peripheral, cut-off portion

does not degenerate. The ganglion, therefore, exercises a trophic or nutritional influence on the sensory fibers outward. But it also does this in an inward direction, for if the section be, as in the last instance, between the ganglion and the cord, we find that the fibers of the sensory root degenerate from the point of section upward, and this degeneration can be traced upward as far as the medulla at least. Moreover, if the ganglion itself be destroyed, the sensory fibers passing through it degenerate in both directions, centrally and peripherally.

Now, ordinary sensation is divisible into the sensations of touch, temperature, and pain, and also the muscular sense. By the latter we know the position of our limbs through information sent to our consciousness concerning the position, degree of tension, etc., of different muscles. The fibers for muscular sense enter the cord in the column of Burdach, and as we ascend to successively higher levels we find that the newly incoming fibers push toward the median line the fibers which entered below. Thus is formed the column of Goll. We shall consider these columns and their fibers in detail when treating of locomotor ataxia, but just here it will not be out of place to say that when a peripheral nerve is divided, although sensation and motion, as far as they depend upon the integrity of the injured nerve, are lost, the muscular sense in the territory innervated by the nerve is not lost. Hence we must assume that between the muscular sense fibers of one nerve and those of a nerve near by there must be a very full anastomosis in the terminal distributions.

In a case of paralysis confined to one limb, the loss of motor power in muscles innervated by one nerve, and the anæsthesia or paræsthesia in its sensory distribution, will enable you to say that the trouble is in that nerve. What the lesion is must be determined by extended examination—it may be due to a stab, or to pressure, or to neuritis of other origin.

If the paralysis in one limb exhibits itself in loss of power in muscles innervated by different nerves, and especially in muscles that act together in some one physiologically combined motion, and if there is no impairment of sensation, you must look for its cause to some diseased condition in the aggregations of large motor cells in the anterior gray horns of the cord.

Should the paralysis affect as a whole the two limbs of one side, remember the possibility of its being of spinal origin from injury, as already mentioned, but also remember the clinical presumption that its cause is in the cortex or the lower part of the pons, or in the medulla. If the face is involved, but on the side opposite to the paralyzed limbs, the lesion is in the lower third of the pons, while if face and limbs of the same side are affected, the lesion is above the last named site.

Paraplegia or paralysis of both lower limbs is due to transverse lesion of the cord. It may be in the lumbar or in the dorsal region. Here the loss of sensation, loss of power (usually) over the sphincters, and the girdle sensation will call your attention to the cord as the structure at fault.

I have said nothing of the presence or absence of atrophy in the muscles. This begins at once on the occurrence of a lesion in the peripheral segment of the motor tract, that is, if the lesion is in the ganglion cells in the anterior gray horns of the cord or in the nerve itself. If the lesion is in the central segment of the motor tract, no atrophy follows except that which results from want of use. The large cells spoken of have a nutritional influence upon the muscles governed by them as well as upon the nerve fibers given off from them. The distinction between the slight atrophy brought on by want of use in a muscle and that resulting from degeneration in the ganglion cells or the nerve trunk is well differentiated by the use of the Faradic current, but this method of diagnosis must be left until we study the special symptoms of cerebral hemiplegia.

A form of paralysis involving one, two, three, or all the limbs is seen in severe cases of multiple neuritis. If the two lower limbs are affected, it may in some respects simulate paraplegia of spinal origin, while if the disease has not progressed very far, the diagnosis of a double sciatica may be erroneously made. The diagnosis of double sciatica is always to be received with doubt. Fortunately, in multiple neuritis the clinical picture is rather characteristic. The paralysis when present is usually limited to the peripheral half of the limb, that is, to the lower leg and the forearm and to the extensor more than the flexor muscles. The latter, however, is the case frequently in paralysis of cerebral or of poliomyelitic origin; so that we may almost believe there is some greater innervation to the flexors than the extensors. In a well marked case of paralysis from multiple neuritis the patient has "drop wrist," as in lead paralysis and musculo-spiral paralysis, and he has "drop foot," so that the point of the foot is directed downward. Hence, if able to walk at all, his gait is peculiar, the thigh muscles acting strongly to lift the "dropped" toes from the ground and throwing the fore leg forward, the foot then coming down with a flail-like motion. A similar walk is seen in some cases of poliomyelitis anterior, but in multiple neuritis the sensory disturbances will be of great service in diagnosis. Areas of anæsthesia surrounded by areas of hyperæsthesia, or *vice versa*, tenderness on pressure along the course of the nerve trunks, impairment of the temperature sense for heat and often hypersensitiveness of the limb to cold, will enable you to make up your diagnosis. The loss of sensibility to heat is sometimes so great that patients through their not appreciating the great degree of heat employed have been severely scalded by the application to the limbs of cloths wrung out of hot water.

COLLETIA.

A GENUS of shrubs from Chili, some species of which are hardy enough for the open air in all but the coldest parts. There are three species in gardens, all interesting and beautiful when in flower. They have spiny branches that are naked, or the few leaves are so minute as to appear absent. *C. cruciata* is the commonest kind; its stems are armed with stout, flattened spines, and its flowers are white and small. It makes a bush about four feet high. *C. biconiensis* is the same as *C. cruciata*. *C. spinosa* (illustrated herewith) has its spines round or awl-shaped, and is a prettier shrub when in bloom than *C. cruciata*, as the white flowers, though small, are very numerous and produced in summer. Under favorable conditions, *Colletia spinosa* grows much taller than *C. cruciata*, and

against a wall will attain a height of ten feet. The names of *C. ferox*, *C. horrida*, *C. armata*, all stand for *C. spinosa*. It makes a formidable hedge in the southern counties, where it flourishes to perfection. *C. serratifolia* is less common than the others, but is extremely pretty when in bloom, the whole bush being a

COLLETIA SPINOSA.

complete mass of tiny white blooms. It grows tall and slender, either planted in the open or against a wall.—*The Garden*.

BAMBOOS.

THE grass family, one of the most useful families of plants to man, is represented over the entire surface of the globe by numerous species. Those that live in our climate, and some of which are of prime necessity (as the cereals, for example), are for the most part plants of unpretentious size, but in equatorial countries we meet

with species of astonishing proportions. Among these are the grasses belonging to the tribe Bambusaceæ, the typical genus of which is *Bambusa*, the species of which are properly called bamboo, from the Malay name. According to Stendel, there are thirty-three species, which are all natives of warm countries and have an extensive range over the surface of the globe.

Some of the species (such as *B. aspera* of the Indian Archipelago) rise to a height of 120 feet.

The variety of purposes to which these plants are applied is almost endless. The Chinese use one of the species in one way or another for nearly everything they require. The sails and masts of their ships, as well as the rigging, consist chiefly of bamboo, manufactured in different ways. Almost every article of furniture in their houses, including mats, screens, chairs, tables, bedsteads, and bedding, are made of the same material. A similar use is made of the hollow reed in Japan, and also in Java, Sumatra, and other Eastern countries. The young shoots of one of the species is covered with a dark green cortex, which the natives of Siam pickle. The young shoots of all the species can be cooked and eaten like asparagus, and the hollow culm contains a saccharine pith of a very pleasant taste. In India the thorny bamboo (*B. arundinacea*) is used for cattle-proof live hedges, as are also *B. nana* and *B. blumeana*.

In the Moluccas, one of the species of bamboo produces stems thick enough to serve, when slit into halves, for canoes. Among the minor uses to which the bamboos are put is the manufacture of canes, the largest and best of which are said to be the product of *B. arundinacea*.

Although the bamboo grows spontaneously and profusely in nearly all the immense districts included in the southern portion of the Chinese empire, the people do not rely upon the beneficence of nature, but cultivate the gigantic reed with much care. They have treatises and whole volumes solely upon this subject, laying down rules derived from experience, and showing the proper soils, the best kinds of water, and the seasons for planting and transplanting the useful production.

A CHINESE REPORT ON THE CONDITION OF CHINESE EMIGRANTS ABROAD.

IN the month of August, 1886, three high Chinese officials left Canton as an imperial commission to inquire into and report upon the condition of Chinese abroad. After thirteen months' absence, they returned in September last, having visited various Spanish, British, and Dutch colonies, and presented their report to Chang Chih-tung, Viceroy of Canton, who has addressed a memorial to the throne containing the substance of the commissioners' observations, together with recommendations of his own. The commissioners have since started on a tour in Borneo, with a view to study the condition of their countrymen in Sarawak, the territory of the British North Borneo Company, and the Dutch possessions, but no report of the results of this journey has yet been made.

The report of the first and most important journey begins at Manila, the capital of the Philippines, which was the first place visited by the commission. Here the Chinese community complained bitterly of the wrongs they received at the hands of the Spaniards, and earnestly begged for the appointment of consuls to protect them, volunteering to pay all the expenses of consular establishments. There are about 50,000 Chinese there, carrying on a most thriving business, notwithstanding the wrongs inflicted on them. They are murdered, their houses are set on fire and plundered, and the authorities sent to investigate the case evince flagrant partiality. Extortionate taxes are levied on them, and, groaning under the burden of their oppression, they were about to petition the Spanish government when the commission happily arrived. From Manila the members recrossed the China Seas to Singapore, where they were received with every civility by the governor. Here the Chinese number about 150,000, and are the richest among the inhabitants. Four-fifths of the landed property is theirs, and large numbers of Chinese laborers pass through the port

THE BAMBOO.