Introductory Address

ON

REST AND MOVEMENT IN TUBERCULOSIS.

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BY

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FOUR years ago, when I had the honour to deliver the introductory address to your society, I directed your attention to the public aspects of the prevention of consumption.¹ It was my endeavour to show the need which exists in every community for a systematized plan of antituberculosis effort similar to that which is now generally known as the "Edinburgh scheme."

In responding to the kind invitation of your President that I should again inaugurate the course of winter lectures, it has occurred to me that you may be interested to hear something regarding the application of the great principles of rest and movement in the treatment of tuberculosis. My thoughts run in this direction because it chances that this year has witnessed the opening of an important addition to the institutions of Edinburgh concerned with the combat against tuberculosis. The Farm Colony—the latest outpost in the campaign—will occupy itself especially with the application of the principle of movement in the treatment of tuberculosis. It is a principle which has for long constituted a chief element in the regimen pursued at the Royal Victoria Hospital for Consumption.

My hope and expectation is that the Farm Colony will succeed, through the longer residence and fresh interest, in rendering permanent for a still larger number the satisfactory recovery which is commonly achieved by the Hospital Scheme of graduated activity.

Change of Outlook on Tuberculosis.

A quarter of a century ago, the conception of the treatment of consumption and allied diseases was entirely different from to-day. Then the patient, whose illness was interpreted as the result of exposure and neglected cold, was protected in every possible way. The pallid, worn, emaciated—perhaps hectic—sufferer was metaphorically and often practically wrapped in cotton wadding and preserved, as it were, in a glass case or handbox. The physician of that time commonly believed he "might not beseen the winds of heaven visit his patient's face too roughly."

Now contrariwise aërotherapy, or the physiological application of open air in treatment, is one of the widely accepted facts of modern therapeutics. It is happily beginning to be recognized that aërotherapy is serviceable not merely in consumption, but in the treatment of most diseases. Aërotherapy is a principle of universal applicability in all lands, at all seasons, and in every sick room. Aërotherapy is a preventive measure of incomparable value. My profound conviction is that, were the vitalizing properties of open air truly understood and utilized, the larger part of disease would cease to be. The day-by-day life of the community would be run on a higher level and the advance of old age would be hindered. The world has yet far to go before it realizes practically the tremendous significance of the mighty principle. Its half-hearted application in prevention and treatment remains one of the most unintelligible sins of the age.

For our purpose to-night it suffices to recall that the majority of physicians have adopted more or less fully the principle of aërotherapy in the treatment of tuberculosis. The question now before us is—Granted that the patient is to be treated on open-air principles, what then? Is he to be kept at rest? or is he to be allowed movement, and, if so, in what form and to what extent?

Most of the older school of doctors—and the school is far from extinct—favoured almost complete rest of the consumptive patient. It was argued that to heal a con-

gested and perhaps ulcerated lung rest was essential. It seemed an almost elementary proposition that the less movement the better for the patient. Movement would presumably injure the lung, both directly and indirectly, through excitement of the circulation and nervous system. I quote from a recent American writer. "A lung," he says, "that is tuberculous should be exercised as little as possible. It should be kept as still as may be, to the end that its recovery may be hastened." The statement contains a truth, but the proposition is made too universal. And so in a good many places still, the majority of consumptive patients are kept for lengthy periods at almost constant rest.

We shall see presently that while rest is helpful, and indeed essential, at certain times, the prolonged continuance of resting treatment is fraught with unsatisfactory results. The patients may seem in many instances to improve. Perhaps they put on weight in large amount. Often they become heavy and corpulent, but it is commonly mere fat; the skin textures remain pallid and toneless; the muscular tissue remains soft and flabby, and the individual himself is far from physiologically fit.

The practice of continued rest in consumption proceeded from a faulty, because insufficient, conception of the disease. The attention of the physician was directed chiefly to the local lung lesion. The conception had hardly dawned—even yet it is insufficiently realized—that the lung lesion is a relatively small part of the illness. The gradual descent downwards, pathetically described in popular language as "decline" or "consumption," is not an expression of the lung disease as such, but rather of a systemic or constitutional intoxication to which I shall presently refer more fully.

Even in respect of the affected lung itself insistence on rest beyond a certain degree and in special circumstances is most fallacious. Let me cite a fact or two in this connexion. In the early days of my work in this department—more than twenty years ago, when the systematized scheme of activity had not been elaborated, when there was no sanatorium for consumption in Great Britain—we instituted classes for physical movement and respiratory exercises in connexion with the Victoria Dispensary for Consumption. With the help of successive officers of the Dispensary I arranged such classes for selected cases from the immense *clientèle* of the institution. The patients used to come—often long distances—at fixed hours and enjoy regular training with regard to posture and healthy respiratory movement. More especially the young were taught the value of a healthy form of chest. Such physiological points were insisted on as nose breathing and the value of slow and full diaphragmatic movement. In addition to this, measured walks of varying amount and gradient were prescribed, exactly as we prescribed medicines. Thus we had walks radiating from the Dispensary round the Meadows, walks over the Bruntfield Links, and walks in various directions on the slopes of Arthur's Seat. The patients reported, at successive visits, their experience in carrying out such instructions, and notes were made of the effects produced.

The results were eminently satisfactory. The patients did remarkably well, and no accident was traced to the adoption of active movement instead of rest. The experience led to a change in my outlook in relation to the meaning of treatment in tuberculosis.

Two practical conclusions of public interest forced themselves early on my mind. The first was that an enormous amount of benefit might be achieved for tuberculous patients of the poorer class by an extension of the system of home visitation and direction; in other words, that the home treatment of the tuberculous poor from a well-regulated tuberculosis dispensary might be made to play a most effective part in the solution of the great tuberculous problem. This led to the completer development of the dispensary system. The second conclusion was that we might hope, by the establishment of hospitals or sanatoriums for patients in the earlier stages, to achieve permanent cures to a degree not hitherto dreamt of, by elaboration of the principle of regulated exercises and graded activity of different kinds.

I am happy to say that these conclusions have been justified in the results obtained from day to day, on the one hand in the home treatment undertaken for so many years from the Victoria Dispensary, and, on the other, in

the systematized regimen of work at the Royal Victoria Hospital and the recently opened Farm Colony.

Neuro muscular Intoxication.

The conclusions involve a much wider conception of tuberculosis than that which concerns the local mischief within the lung. This has regard to the effects of the disease on the patient's system. Tuberculosis implies a progressive intoxication. The toxins produced by the tubercle bacillus appear to exert their vicious influence particularly on the neuro-muscular apparatus.³ The toxin is especially a muscle poison.

This view can hardly be accentuated too much. It illuminates many points in the morbid history of the consumptive which have not been hitherto sufficiently explained.

Thus, what are the earliest symptoms which the patient manifests? They are not, as is usually supposed, referable to the lungs. The disease is far on when the patient begins to cough and expectorate. Long before local symptoms show themselves, the patient—although he may not understand it or still less complain of it—has experienced a sense of tiredness, languor, disability for mental and bodily effort, enfeeblement of circulation and gastro-intestinal disablement, including loss of appetite, dyspepsia, constipation, etc.

The occurrence of such symptoms must not be passed over lightly. Contrariwise, the practitioner of experience watches for their first appearance. They are to be interpreted not vaguely as evidence of overwork, but as evidence of the systemic, and, more particularly, the muscular poisoning to which I have alluded.

This process of muscular poisoning reveals itself *visibly and palpably* in the progressive wasting of the muscles, both of trunk and extremities, their advancing flaccidity and the increase of what is termed "myotatic irritability." This condition of muscle is an expression of mal-nutrition. It is a muscular dystrophy dependent on intoxication.

In this sense, tuberculosis may be defined as a constitutional disease, dependent on invasion by the tubercle bacillus and characterized by various local lesions and widespread systemic intoxication, which reveals itself especially by generalized progressive muscular dystrophy.

Incidentally, it is interesting to note that while the toxin of tuberculosis constitutes a muscle poison, muscle itself is one of the few structures on which the tubercle bacillus does not readily grow. It is possible that the elective affinity of the toxin for muscular structure may have some bearing on this.

Indications for Alternating Rest and Movement.

Returning to the question of rest or movement, how are we to apply the principle to the varying manifestations of disease which occur?

So long as the tuberculous process is in active operation toxins are readily elaborated and passed freely to the muscles with resultant progressive dystrophy. This dystrophy affects not only the muscles of the trunk and extremities *where it is evident*, but affects likewise the heart muscle, the muscles of the vessels, and the muscles of other viscera. At this stage the indication for treatment is mainly rest. Rest has the double advantage of tending to stay the active local lesion and of limiting the output of energy by the dystrophic muscles.

On the other hand, when the tuberculous lesion is less active or in process of arrest, and the production and carriage of toxins is correspondingly less abundant and rapid, the dystrophic muscles tend to recover themselves physiologically.

Nothing repairs muscular tissue so certainly as natural movement. This is the *motif* and guide in the institution of regular activity.

Let me recall the fact that tuberculosis tends to occur more frequently in persons who lead a sedentary, or at least a relatively inactive, life. This is not an absolute rule, but its application is a wide one. I may go further and say that, in proportion as the individual whose work involves a sedentary existence indoors counteracts the fault of his life by regular activity in the open air after working hours, the tendency to tuberculosis is limited and may be overcome.

I may remind you that the same principle may be traced in comparative pathology. Which are the animals most frequently affected by tuberculosis? Not the dog, not the horse, not the goat. It is the stalled cow which suffers most; and of the bovine species there is a marked difference as to frequency between comfortably-housed milch cattle and Highland cattle living a relatively active out-of-door life during the greater part of the year.

It is likewise freely admitted that nothing so certainly checks the earliest threatenings of tuberculous disease in the child, whether in glands, lungs, or elsewhere, as turning the patient out into the wild and letting him lead the natural, active life of the Highland pony.

It is a different matter, when the tuberculous process is further advanced and lung destruction is in progress. Here we are face to face with morbid conditions, both local and general, which are best met by rest.

Take, for example, the occurrence—say, the repeated occurrence—of bleeding from a cavity within the lung. It goes without saying that here rest, both mental and physical, is to be enjoined.

Again, where the lung is breaking down rapidly and there is continued absorption of poisonous products, with corresponding systemic intoxication, evidenced by disturbance of temperature, increased pulse-rate, and rapid muscular wasting, rest must be the order of the day. The excessive waste must be met by economy in wear and tear. The circulation, which is the chief channel of dissemination of the poison, must be kept as quiet as possible.

As acuter manifestations disappear under the influence of rest, and the risk of local and constitutional disturbance is reduced, the need for complete rest is lessened or removed. This is in keeping with the facts of pathology in relation to other acute morbid processes.

As recovery proceeds further, the aim comes to be the restoration of physiological function—both locally, so far as the respiratory function of the lung is concerned, and generally, so far as the circulation and musculature are concerned. The process of repair is most readily traceable in the muscles of the trunk and extremities. By the institution of natural movements, the physiological cure or "recreation" is assisted, and there follows a gradual return towards the normal condition of health of every organ. I need hardly remind you that, for us all, health is largely governed by the harmonious alternation of activity and rest.

While natural repair is thus hastened by carefully adjusted movement, there is reason to suppose that at the same time a degree of relative immunization to tuberculosis is secured. It may be that under the influence of activity a process of autoinoculation is instituted. That is to say, by reason of the accelerated circulation a certain amount of toxin is carried through the system. The presence of the toxin stimulates the system to react, and to produce certain opposing elements or antibodies.

If we can adjust the activity so nicely as to lead to the discharge of just so much toxin as will cause a serviceable and not an excessive reaction, we may hope to achieve by natural methods what we seek to effect in the treatment of tuberculosis by vaccine-therapy—that is, by the use of tuberculin.

It will be readily understood that during an *acute* tuberculous process, with disintegration of lung tissue, the manufacture of toxins and their subsequent discharge into the circulation may be in excess of the possible production of antibodies by the system. The tissues are thus left to soak in a highly toxic element, without the antagonistic influence which in *less acute* processes Nature herself is able to provide unaided or may be induced artificially to afford.

Regulation of Dosage.

The amount of activity allowed must in every case be determined with exactness. There must be a careful estimation of dosage. Regard must be paid not vaguely to the nature of the case or the so-called stage of disease, but adjustment must be guided by the needs of the *individual* patient. It is easy by over-keenness and haste to thwart the effect which the physician is seeking to attain. Activity in excess may serve to aggravate the local process. The lung trouble may once more take on an acute character, and, what is especially significant, the

excessive discharge of toxins through the system may be recommenced. In other words, an exaggerated auto-inoculation may ensue with corresponding retardation of cure.

Systemic disturbance from excessive activity reveals itself by evidence which is available to the physician and even to the patient. Unhappily, both patient and physician, if not keenly alive to the possibility, may fail to trace the disturbance to its proper source. The evidence available may include such symptoms as loss of appetite, malaise, headache, less or more fever, and increased pulse-rate.

The possible occurrence of these untoward effects implies the need for most careful supervision of persons undergoing treatment by movement for some little time at least. It is only the watchful observer in frequent relationship with the patient who can quickly discriminate the effects of excessive dosage and who can wisely determine the decrease or increase of dose in a given case.

On this account, such treatment can be more efficiently initiated in a hospital or farm colony, where the patients are more or less constantly under the eye of a trained observer and where increase of dosage is sanctioned only where no contraindication is present. Under such conditions the degree of tolerance on the part of the patient can be studied with great exactness. The regulation of the dosage thus becomes a scientific procedure.

It is another matter when patients endeavour to regulate the treatment themselves. There is, of course, a natural desire on the part of the patient to progress. Minor indications of danger or positive harm are apt to be missed and the limits of tolerance passed. Danger signals are passed and accidents happen. The result is failure, disappointment, and even larger disaster. The fault is not one of the system but of the manner in which it was carried out.

I have said that indications for the reduction of activity will be found in increased rapidity of pulse-rate and irregular oscillation of temperature just above the normal line. Indications for the complete cessation of active movement and a return to more or less complete rest are afforded by elevation of temperature over 99° F., a continuing pulse-rate of over 95 per minute with corresponding diminution of blood pressure, recurrent headache, especially at the end of the day, and an undue sense of fatigue.

Where no such contraindications occur, it is found possible to increase the activity undertaken until its amount be as great as, or, indeed, until it is much greater than, the activity previously undertaken by the individual in health.

After sufficient trial at this high level, the patient may commonly be allowed to guide himself as to the discharge of energy, which is sufficient to keep him in condition and is not excessive. It is possible that by this time the local and constitutional damage have been satisfactorily repaired and the affected person has undergone a sound, physiological education which he is not likely to forget.

Such considerations and facts have formed the basis of the scheme of physical treatment which has gradually been elaborated and systematized during the past eight or ten years at the Royal Victoria Hospital, and to the details of which I shall refer in a moment or two.

For the majority of the patients, the regimen as carried out within the hospital is found to be complete, and the patients are commonly rendered fit to return to ordinary duty. In the case of some 25 per cent. of the patients, however, there is need for something more. It has been found that, after the disease seems to have been arrested and the muscles have recovered size and tone, these persons remain unduly liable to relapse. An immediate return to their ordinary avocations, more especially in the case of indoor workers, is apt to involve recurrence of trouble. This implies disappointment and economic leakage, which I believe might be saved. It is for this class of persons that the Farm Colony was conceived. The colony is a kind of post-graduate school suited to the requirements of a certain number of individuals, who need more prolonged surveillance and direction than is convenient at the hospital.

Scheme of Physical Treatment.

A rapid sketch of the scheme as carried out at the Royal Victoria Hospital will serve to illustrate the significance of the alternating principles of rest and movement.

On admission each patient is placed at complete rest. During this stage, in addition to minute examination of every organ, the patient's general condition is carefully observed. According to the estimate which is made, the length of the resting period is fixed. Thereafter, in the absence of contraindication, the patient is gradually advanced through the other stages, according to his or her physical condition. The nature and amount of activity are definitely prescribed, just like drug treatment. The dose is increased or diminished as the temperature chart, pulse-rate, and other indications suggest. A coloured badge is given to the patient to denote the stage he has reached.

I. RESTING STAGE. (White Badge.)

On admission to the hospital all patients are prescribed complete rest, lasting from a few days to several weeks, according to the individual case.

II. STAGE OF REGULATED EXERCISES. (Yellow Badge.)

This includes:

1. Walking varying distances, from $\frac{1}{2}$ mile to 5 miles—(a) on the level; (b) on sloping ground.
2. Various respiratory exercises once or twice a day.
3. Other forms of movements to improve carriage of shoulders, head, chest, etc.

III. STAGE OF REGULATED WORK.

The work is chosen with a view to utility and with due regard to the patient's individual case, and to his past trade. This stage is subdivided into four grades (A., B., C., D.).

III A. (Pale Blue Badge.)

Picking up papers, leaves, and other light rubbish in the grounds.
Knitting. Sewing. Drawing.

III B. (Green Badge.)

Emptying garden waste boxes, and assisting to carry away rubbish.
Carrying light baskets for various gardening purposes.
Light painting work (gates, fences, furniture, etc.).
Wiping shelters. Setting tables and laying cloth in patients' dining-room.
Cleaning silver.
Cleaning brasses, towel rails, and taps.

III C. (Deep Blue Badge.)

Raking. Hoeing. Mowing. Sweeping leaves.
Drawing two-wheeled barrow with assistance.
Other gardening jobs requiring a similar amount of exertion.
Heavier painting work.
Sweeping shelters. Scrubbing floors.
Cleaning boots. Cleaning knives.
Assisting in laundry (folding clothes, etc.).
Washing and drying dishes.

III D. (Red Badge.)

Digging. Sawing.
Carrying heavy baskets for various gardening purposes.
Wheeling and drawing full wheelbarrow, and other heavy gardening work.
Drawing bath chair.
Bathing other patients.
Mangling. Window cleaning.
Polishing floors. Sweeping and cleaning courtyard.
Carpentering. Joining.
Attending boiler. Engineering.

N.B.—In Grades B., C., and D. patients make their own beds and go errands if necessary.

Results.

As to results, I am happy to say that it has worked admirably. The progressive improvement on the majority of the patients has been striking. Physically, the results are registrable from day to day in satisfactory fashion.

The results include a progressive sense of well-being, keenness to live and work, healthy appetite and digestion, return of fresh colour to face and skin, and gain in weight. I find, for example, that of a total of 109 patients now under treatment at the Royal Victoria Hospital, no fewer than 103 have gained weight. I would have you especially note that the gain in weight is dependent not on fatty overloading but on increase of muscular tissue. The latter is the most striking phenomenon of all, and I shall throw on the screen several illustrations of this visible and palpable change. It is an increase in both size and tone, with corresponding increase of working capacity.

Taking the collective body of patients present in the hospital at any one time, the system produces a fine procession of persons, some just emerging from serious

sickness and others at varying stages of advance towards perfect recovery, the patients severally and literally "working out their own salvation."

At the present moment—and this is a pretty usual distribution—I find that more than one-third of the patients have already reached the two highest grades of activity, namely, III C, and III D. Taking the male patients, who happen to number 47, I find that no fewer than 17 have reached these higher stages. I have before me a detailed report of the progress of these individuals. I shall not trouble you with all the details, but content myself with the statement that every one of them has made a remarkable increase in muscle value, and all have put on weight, from a few pounds up to 21 lb. While on admission the record of the patient's condition commonly includes one or other of the following phrases: "weakness," "hectic flush," "quite unfit for work," "very thin and delicate," "very great weakness," "worn-out appearance," "easily tired on exertion," "quite done up," "thoroughly run down," etc., with corresponding involvement of lung (in all patients both lungs having been affected), the present record runs somewhat as follows: "symptoms have almost entirely disappeared," "feels splendid," "looks very fit," "general and local symptoms have entirely passed away," "able to do a full day's hard work," "enjoying very hard work which he has never been able to do before, with no feeling of tiredness," "never felt better in his life," with corresponding improvement of the local condition within the lungs.

We have, of course, our disappointments. Tuberculosis strikes different persons unequally. At times the course of illness is so acute that no help is of avail. At other times treatment, from one cause or another, has been delayed too long. Sometimes the resisting power of a patient is unduly low. But given a patient of ordinary resisting power, in whom the disease has made slight inroad or, at most, only moderate advance, there is good expectation that under sufficiently prolonged treatment by aërotherapy, rest, and carefully graded activity, a return to health will be achieved. In many instances, the physiological value of the procedure is such as to place the individual on a higher plane of health than he ever reached hitherto.

REFERENCES.

¹BRITISH MEDICAL JOURNAL, December 1st, 1906. ²*Transactions of the Sixth International Congress on Tuberculosis*, Washington, 1908, vol. 1, part 2, p. 922. ³*Transactions of International Medical Congress*, Washington, 1887, vol. 1, p. 205.

A Lecture

ON

"EYE" IN SPORT.

DELIVERED AT ST. THOMAS'S HOSPITAL BEFORE THE MEDICAL AND PHYSICAL SOCIETY.

BY

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My attention was first particularly drawn to the subject by an article in *Fry's Magazine* in 1908 by "R.A.M.C." It purported to describe the physiology of sight in games, and was entitled "The Eye in Sport." The article was well written and interesting. I feel convinced that "R.A.M.C." is a sportsman and a good fellow. This impression will give me grounds for hoping that he will forgive me for attacking his article, and for pointing out that there was scarcely a correct explanation throughout.

When we speak of "eye" we do not mean the two portions of one's body that are situated on each side of the nose. They have, indeed, a very important share in establishing "eye," but nothing more. "Eye" really exists in the brain. It is, in fact, a very compound thing, a subconscious brain judgement involving many other organs than the actual anatomical eyes. It involves knowledge, experience, very largely the sense of touch, and sometimes the sense of hearing or smell. This important fact is generally lost sight of, and it is the pitfall in which "R.A.M.C." hopelessly flounders. He and others, among whom are particularly gunmakers, are

obsessed with ideas of the power of the so-called master eye. It is the use of the master eye, they say, that enables you to shoot straight, to hit a golf ball, to smash a tennis ball, to pot the red, and such other things in the same category that call for the use of "eye." "R.A.M.C." emphasizes this mistake at every turn, and it is the main object of this lecture to explain what is the real meaning of "eye," and to remove the false impression that the master eye in the normal individual is of the paramount importance that is usually attributed to it. I wish to point out, among other things, why in golf the phrase "Keep your eye on the ball" should be (*pace* "R.A.M.C.") "Keep your eyes on the ball"; why in shooting your gun should not be twisted into all sorts of fantastic shapes at the will of the gunmaker; why in cricket the more modern position of standing square to and facing the bowler generally produces the best bats, and why in billiards you should use both eyes as most do, and not only the master.

There is no doubt of the fact that there is a master eye, and this can be proved in numerous ways. In right-handed people, where the acuity of vision in each eye is equally good or nearly so, it is usually the right eye. When, however, the visual acuity of one eye is defective, then the other eye, whichever it may be, is selected for the mastership. In certain pursuits, rifle shooting for instance, the use of one eye is essential, for it is a physical impossibility to align backsight, foresight, and the target with each eye at the same time, and if you do not mentally grasp this point, it is easily illustrated by a rough drawing. Place two dots side by side to represent the two eyes, put another dot as far off as you like to represent the target. Now draw lines to represent the lines of vision from the two eye dots to the target dot. Let a fourth dot represent the sights of the rifle and it is obvious you cannot place it in both lines of vision at the same time. You can place it in one or the other, but not in both; and here I may explain what is the stock argument of gunmakers and others who advocate cast-off guns when the left eye is the master. They point out that, if he fires from the right shoulder, the left master eyed man places the breech end of the barrels which corresponds to the back sight of a rifle in the line of vision of the right eye and the bead at the end of the barrel in the line of vision of the left eye, and consequently the shot goes wide to the left; and this is perfectly true if the individual tries to shoot in this way, but the cure is not to make a distorted monstrosity of his gun, but to teach him to shoot properly, which, as I shall presently point out, is to disregard his gun altogether so far as direct vision is concerned.

Destructive criticism is very cheap; therefore I propose now to devote my attention to constructive criticism and to explain in greater detail the meaning of "eye." I am fully aware that I shall lay myself out in turn to a vast amount of adverse criticism, but in my arrogant belief in the correctness of my views I am prepared to meet all and sundry on this ground. I have taken a good deal of trouble, not being an expert at games myself, in talking over the subject fully with those who are experts, and I have found that in nearly all cases they are ready to discuss freely the points of the games in which they are proficient. There is only one class of men that I have found an exceeding great difficulty, and they are in other matters, I should think, the most genial, the most interesting, and come more universally than others into the category of "good sorts." I allude to artists. Knowing nothing about art myself, I have always approached them with great humility and simply as a learner. I am armed with a certain amount of physiological knowledge, and I wish to ascertain how this is dealt with from an artistic point of view. I remember once trying to get some information from a member of my club, a good artist and one of the most genial men at other times whom I have ever met, but all I could get from him was flat contradictions, not on the question of art, but on the facts of physiology of vision, of which presumably I ought to know something. He is not by any means the only one, as I have said before, from whom I have found it impossible to learn. Artists seem to think that one is attacking their art and that no outsider has any right to assume any knowledge that concerns the question of their art. But, of all problems, I think "eye," where it concerns art, is the most interesting, for it is so obviously the mental eye that they use and not merely the