The incidence of iritis during the acute stage of rheumatism is universally allowed to be extremely rare, but a case in which it followed shortly after is recorded by Forster,¹ of Lowestoft, and it is a most interesting and instructive one. The patient, a girl aged 12½, had an attack of acute rheumatism in which the acute symptoms lasted fourteen days and then subsided. Three days later chorea came on, and when it had lasted four weeks a monocular iritis developed, followed by endocarditis. It is to be noted that the iritis did not develop during the acute stage of the rheumatism. Eventually the child got quite well. Here the sequence of events is so marked, so obvious, that to argue that we are not dealing with cause and effect would appear to require the strategy of a dialectician. Strategy has no place in a scientific discussion, and we must allow that if cases such as this were frequent there would be nothing more to be said. But the fact of their extreme rarity requires very great consideration, especially when we remember how common are cases of so-called rheumatic iritis. The weakness of the position is shown if, instead of arguing from the particular to the general, we reverse the process. A patient is brought to us with so-called rheumatic iritis. How do we know that it is rheumatic? Having excluded syphilis and gonorrhoea, and found that at some time the patient has had acute rheumatism, we label the case and pack it away in a mental pigeon-hole as an undoubted instance of rheumatic iritis. Perhaps if we had asked the patient if he had ever had measles we should have received also an affirmative answer. If, however, the patient has not had acute rheumatism we inquire about rheumatic pains, and rest satisfied with our diagnosis if we can detect more or less evidence of swollen joints or aching limbs.

Turning from the clinical aspects to bacteriological investigations, we find evidence pointing to the artificial production of iritis by the rheumatic diplococcus or micrococcus. Although Fritz Meyer, Ainley Walker, and Beaton do not appear to have produced it, Poynton and Paine, in their contribution to the *Transactions of the Ophthalmological Society* (vol. xxiii, p. 39), report that iritic symptoms ensued in rabbits after the intravenous injection of cocci, in one case from ordinary rheumatic fever in a child, and in another from malignant endocarditis of rheumatic origin. In no other case were there symptoms pointing to iritis, although they made repeated experiments. In their first successful case, on the seventh day there was injection of the conjunctival vessels, discoloration of the iris, and considerable exudation into the anterior chamber. But they state that the appearance was not like that of hypopyon. The rabbit died on the tenth day. The symptoms do not appear to have resembled altogether those one is accustomed to see in the condition generally designated rheumatic iritis, and they suggest the possibility of a purulent or metastatic choroiditis. The iritis occurred in the left eye only, but it is not stated into which ear the injection was made. In the second case the injection was made into the ear of a rabbit intravenously, the culture being prepared from the case of a boy who died from malignant endocarditis two years after an attack of acute rheumatism. In four other rabbits that were injected from the same source there was no iritis. In this case the evidence furnished by the authors seems hardly sufficient proof that the endocarditis was undoubtedly due to the *Diplococcus rheumaticus*. Bearing in mind the multiplicity of organisms capable of producing malignant endocarditis, and the fact that the ordinary pyogenic organisms are responsible for the greater number of cases, it seems desirable that further investigation as to the identity of the micro-organism should be made.

According to C. W. Jennings, rheumatic iritis is a common form of the affection, 25.4 per cent. of all cases being due to it. Nevertheless, the absolute connexion of rheumatism and iritis, both clinically and bacteriologically, is still lacking.

In looking through my cases, I find that in the last 80 private patients suffering from iritis, excluding traumatic, there were 4 who had suffered from acute rheumatism at some previous time; 5 per cent. is not a strong basis upon which to erect an etiological superstructure. Many of the other patients confessed to "rheumatic" pains of varying intensity when asked; but do not a large number of patients suffering from any

disease usually acknowledge that they are rheumatic when the leading question is asked? Evidences of rheumatism, or at least of arthritic disease—such as distorted or fixed joints or nodules—were seen in 7, whilst gonorrhoea was acknowledged to have preceded the iritis by not more than two years in 9 patients, and specific disease accounted for 15. I repeat that I think it too frequently happens that if we can exclude syphilis and gonorrhoea, we are satisfied, when we find that the patient has indiscriminate pains in indeterminate regions, to call an iritis rheumatic. In many of such cases further investigation might throw doubt upon the diagnosis. Patients cannot be expected to say anything about diseases which they think have no connexion with their eye trouble, and so it happens that nothing is mentioned by them about a previous septic throat or pyorrhoea alveolaris. Haematemesia and dysentery and dyspepsia are overlooked, and toxæmias of all descriptions are forgotten.

In conclusion, it is desirable that full details of all cases of iritis occurring during the acute stage of rheumatic fever should be recorded. If the physicians of the large London and provincial general hospitals, who see so many cases of acute rheumatism, would help in this direction, a definite conclusion might be arrived at.

REFERENCE.

¹ BRITISH MEDICAL JOURNAL, 1903, vol. i, p. 543.

THE NORMAL ORTHOGRADE POSTURE.

BY

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In the course of my clinical work, in order to effect the lasting cure of many throat, nose, voice, and speech patients, I found the absolute necessity of certain measures which, when first adopted by me, were purely empirical. Such measures were suggested by the results of gymnastics, breathing exercises, and voice training as adjuvants to accepted medical and surgical treatment and educational and hygienic routine.

At that time these collateral measures were completely ignored in the textbooks on, and in the clinical teaching of, laryngology and rhinology in this country. But to such an extent had they become part of my own regular treatment and instruction that in 1893¹ and onwards I published clinical lectures and statements advocating regular postural, respiratory, voice, speech, and nerve co-ordination training for the re-education of patients defective in those respects. Continuous experience has naturally led to many improvements in detail for therapeutic application, while incessant inquiry into the scientific basis of such matters has opened up some interesting problems.

The point I desire to refer to on the present occasion is the uncertain signification of the term "normal ortho-grade," "perfect erect," or "correct" posture. Since the erect posture is the resultant response of man's central nervous system and musculo-skeletal machinery to gravitation—"the chief resistance to be met by terrestrial animals" (Herbert Spencer²)—and the contest is a life-long one, there should be no doubt or ambiguity about what is the "normal" in posture.

Without any precise conception of what is man's normal erect posture in standing, few have denied the importance of a good carriage. The Greeks, indeed, we learn from Aeschylus, Xenophon, and Hippocrates, had several words signifying "upright posture," and such erectness was doubtless one of the main aims and results of their physical training. Among the Latins both Ovid and Cicero spoke of "erectness" as the great human feature. Surgeons recognize the influence of habitual exaggerated faulty postures in producing numerous deformities. Physicians also seek to correct a rounded back and sunken chest, which cramp and crowd the lungs, heart, and abdominal viscera. Anatomists, too, have recognized the vast changes in man which have directly

resulted from his assumption of the erect posture in his descent from a pronograde ancestor; and lastly, physiologists are well aware of the influence of gravitation and of extreme changes of posture on the circulation.

In spite of all this, as far as I can find, no attempt has been made to accurately define the "normal orthograde posture," or to consider whether certain variations of posture—habitual deviations from the normal which might at first be thought minor or insignificant—might not be responsible for very grave derangements in the working of the body, although the latter might be of very slow evolution.

My contentions are:

1. That gravitation is potent in varying the relative positions and mutual pressures and frictions of such contiguous solid organs in the body as are capable of relative displacement as well as in altering the tensions these experience in postures differing, perhaps, but slightly from each other. Such variations in posture tend to induce different types of respiration which still further alter the distribution of mechanical force incident at any spot. It is obvious that the brain and musculo-skeletal mechanisms bring about co-ordinated adjustments to preserve the equilibrium, while at the same time the necessary movements for the oxygenation of the blood and other internal movements are going on. Also the injurious effects of any excessive incident mechanical forces are concurrently obviated by similar co-ordinated adjustments, which are deep reflexes initiated in end organs at sites of excessive incident forces, and having as their objects the inhibition of the conditions causing such abnormal pressures. There are nevertheless limits of time and degree to Nature's protective adjustments. If faulty postures and their concomitant faulty modes of respiration—especially belly-breathing—are habitually and incessantly adopted, a large body of clinical evidence shows that pathological changes take place at the sites of incidence of excessive intrinsic mechanical forces, and as a direct consequence thereof, and of a nature varying with the intensity and duration of the incident force, and the variety of cell or tissue acted on.

2. These facts can and should be utilized by physicians as potent aids in the cure and prevention of disease and promotion of health. The method I have elsewhere outlined,⁸ and have named psycho-postural-respiratory training.

3. Systematic inculcation of the normal erect posture during growth, and the type of respiration naturally associated with it—being the active conscious neutralizing or antagonizing of the faulty postures of modern civilized life—is the main factor in the arrest of physical degeneration, and will promote the return of the human form to that of the ancient Greek.

An essential preliminary to the examination of my contentions is an accurate definition of terms. What, then, is the normal orthograde posture? The word "orthograde" is a hybrid not discoverable in the classics, but having been adopted by anatomists and anthropologists as the equivalent of "erect," I shall use it in that sense.

The subject of "posture" appears to be consigned by general consent to a "no man's land" adjacent to the borders of many sciences. None of them seems to desire it. Most leading works on anatomy and physiology ignore it. Schäfer's standard textbook is a notable exception, but even in this his contributor, Haycraft, after discussing the experimental work of the Webers, Branne, Fischer, and himself, lays down no conclusion for the guidance of physicians and educationalists.

Is the problem insoluble? I think not. It is quite true that three serious fallacies beset all the inductive work that has hitherto been done.

1. On setting out to determine the "normal," the experimenter has started with the assumption that the subject under observation was "normal," which may not have been the case.

2. It has been assumed that the distribution of weight is the same in the horizontally-placed, non-breathing, frozen cadaver as in the vertical-standing breathing man. This obviously omits the influence of gravitation, one of the main factors in the normal erect posture.

3. There has been mental confusion between the "normal" and the "average."

The true normal in living man cannot be found by

measuring a chance hundred of so-called "ordinary healthy individuals" and taking an "average." Each of these individuals of to-day has been more or less similarly subjected to similar injurious influences of civilized life—for example, long-continued and repeated bad postures during growth and habitual work, such as lounging, school desks, easy chairs, feather beds, corsets, badly-shaped boots, imitation of bad models, sedentary habits—without sufficient compensation for those influences by others calculated to systematically antagonize their injurious effects on the working and form of the body. The average obtained from such subjects must be something "abnormal" or "subnormal," even if not greatly removed from the "normal." Although "normal" is a term with many meanings and applications, it surely should imply in anatomy a "standard of perfection of form and structure" to be aimed at; and in physiology the "mode of obtaining optimum efficiency" out of the human machine or of getting it to do its routine work with least possible expenditure of power. If orthodiagraphs, etc., had been available 500 B.C. and applied to a chance hundred "ordinary healthy individuals" among the ancient Greeks, the resulting average would have given a so-called "normal" very different to that gained from civilized moderns to-day.

The "normal," then, must be an "ideal," gained from all men of all time. Loose unsatisfactory conceptions as to the "normal" are responsible for a large part of the defects, deformities, disease, and degeneration of to-day, because slighter deviations therefrom, which can be corrected in an early stage by training, are neglected until their results are irremediable. It follows that what is "normal" should be authoritatively laid down by scientific experts to doctors and teachers wherever possible. Is this possible in the matter of posture?

We may have been driven to the conclusion that in living man the "normal" in such matters as posture and breathing is not determinable by experiment or observation of averages. The inductive method, supreme as it is in arriving at conclusions when only one variable exists in the phenomena under observation, shows its limitations when there are indefinite simultaneous variables, including man's central nervous system, gravitation, oxygenation, etc.

In such cases to find truth it is necessary to work deductively from general philosophical principles and frame hypotheses to be subsequently tested whenever possible by experiment, but also by reasoning from the observed effects.

The advertising schools of physical culture have, of course, prematurely exploited the unoccupied field. I show pictures of what is deemed the "correct posture" in standing, published by the professors of eight of these systems, English or American, vaunted as original. When analysed by vertical and horizontal parallel lines, they are seen to be purely fancy pictures, *ad captandum vulgus*, and some show incompatibility with the law of gravitation. They all differ from each other, and from what I show as, and give reasons for regarding as, the "normal" erect posture to be aimed at in education and in therapeutics. It will be seen from other pictures shown how largely my conception agrees with that of the figures on vases and monuments of all ancient races as contrasted with modern sedentary and slouching peoples.

Approaching posture from a deductive standpoint my arguments are as follows: The living body is a complex machine or engine for the transformation of energy derived from its intake. The object of the life of an animal is the dominance and persistence of the species to which it belongs. To secure optimum efficiency for each individual of the species as long as it is at work, and to maintain such efficiency as long as possible, afford an ample object for economy of force in the living machine. A maximum aggregate of power is thus rendered available for the whole species in its combat with the environment.

Man's erect posture is an immense source of economy to him, owing to the increased vertical elevation above the ground of the distance receptors—the organs for sound, light, and smell. He has, therefore, an enlarged horizon of environment. This not only gives him increased and early knowledge of favourable and unfavourable events in that environment, but affords time for deliberation and contrivance in avoiding dangers or pursuing benefits—an

immense advantage in the economy of energy both for the individual and the species as against most pronograde competitors in the struggle for existence. The chief change producing maximum vertical elevation of the head is the bringing the axis of the vertebral column and of the lower extremities into the same vertical line. This is rendered possible by man's increased power of extension of the hip and knee joints. The necessary distancing is effected by the willed extension of the vertical axis in which are the centre of gravity of the cranium, the vertebral column, the pelvis, and the lower extremities.

The weight of the body being borne entirely by the lower limbs, the upper limbs, freed from the task of aiding in station and progression, become available for prehension and movements involving delicacy of touch and manipulation, such as writing—that is, making distinct signs to represent sounds or things, and setting free the jaws, teeth, and mouth for other purposes. These latter, eased of their functions as weapons of offence and defence against enemies, and from the duties of seizing food, are left free for the duties of speech—that is, the modification of the laryngeal voice to make distinct articulate sounds to represent different things and the better expression of the emotions. Hence the erect posture gives man advantages as to sight, sound, smell, touch, and delicate manipulation, voice, and speech, which are represented structurally in the increased intricacy and quantity of his brain structure. These increasing powers demand increased attention to man's early training. Man's education does not always demand conscious instruction. In the absence of unfavourable circumstances, he can learn by unconscious imitation of good models.

While natural selection was bringing about maximum vertical elevation of the head, *pari passu* man was learning to secure maximum stability of bodily equilibrium in the most erect posture. To do this with the minimum expenditure of energy involved much redistribution of the weight of the skeletal and visceral structures around the new vertical axis, in obedience to gravitation, so that the plumb-line through the centre of gravity might fall within the diminishing area of support now restricted to the feet.

Among the changes promoting maximum stability of equilibrium are:

- (a) The structure and strength of the foot and ankle-joint.
- (b) The inclination of the pelvis to the spine.
- (c) The anterior convex lumbar curve of the spine.
- (d) Shortening of the antero-posterior diameter of the thoracic cage as compared with the transverse.
- (e) The balancing of the head on the atlas by the occipital condyles coming to lie in the median fifth of the base of the skull: (b), (c), (d), and (e) help to bring the centre of gravity of the trunk over the hip joints.

Further changes to save power are:

- (a) The adhesion of the central tendon of the diaphragm to the fibrous pericardium and so to the deep fasciæ of the thorax and neck so as to aid in mechanically supporting the viscera.
- (b) The fixation of the intestine to the abdominal wall by additional mesenteric adhesions forming mechanical supports.
- (c) The maximum use of the passive skeletal structures (bones, cartilages, and ligaments) to resist gravitation and maintain the form and posture of the body, the equilibrium being automatically controlled by the cerebellum so as to minimize expenditure of energy on both cerebral and muscular accounts.
- (d) The increased complexity of brain organization and development.

The tendency of all these modifications in structure is to promote economy in the expenditure of power in the working of the human machine. Nature exemplifies this "principle of optimum efficiency" in all her works, and man's structure and function are "normal" in as far as he is educated to habitually conform to this ideal or standard.

Applying these considerations to the present problem, the normal orthograde posture may be defined as that in which:

1. The centre of gravity of the head is vertically over the centre of the base of support.
2. The vertical plumb-line joining these points bisects the median transverse occipito-condyloid axis, and also the

intercotyloid axis, passing through also the centre of gravity of the mass made up of the trunk and upper limbs.

3. The centre of gravity of the head, that of the trunk, and the centre of the base of support, are actively distanced as much as possible from each other by fullest possible extension of the vertical axis in which the above points lie with each in-breath until the extension becomes automatic and unconscious.

This posture should be the basis of all physical education for the young. It is the ideal we should seek for every child, the one we should endeavour to get stereotyped by growth in form and structure, the one to which such child should automatically return after action or relaxation. The subject trained thus has an easy and graceful carriage, a straight back, well-poised head, a raised, expanded, and mobile thorax well distanced from the pelvis, a flat abdomen, and all the internal organs in constant correct position for best work. The postures permitted and taught by some physical culturists with retracted head, stiff neck, protruded abdomen, hollowed back, and bent knees, do not comply with my definition, and are absolute caricatures of the normal erect posture, and directly produce deformity and disease. Moreover, the normal erect posture is the fundamental essential for all efficient respiration, correct voice production, and speaking. Lastly, the influence of the normal erect posture in the prevention and treatment of disease is of a potency as yet but barely suspected. Limits of time and space prevent my entering into details here, and I must refer readers to other papers on the subject. For the present I venture to invite scientific experts to consider my definition of the normal orthograde posture.

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- ¹ Scanes-Spicer, *Clin. Journ.*, October 18th and 25th, 1893; *St. Mary's Hosp. Gazette*, June and July, 1897; President's Address, Section of Laryngology, *BRITISH MEDICAL JOURNAL*, vol. ii, 1900. ² Spencer, *Principles of Biology*, vol. ii, p. 126. ³ Scanes-Spicer, *A New Cardinal Principle*, etc., *Medical Press and Circular*, February 9th, 1909. ⁴ Schäfer, *Textbook of Physiology*, vol. ii.

Memoranda:

MEDICAL, SURGICAL, OBSTETRICAL.

COLLAPSE IN A BABY.

THE following case seems to me of interest from the cause of the attack compared with its severity:

A few months ago I was called in to see a baby who was said to have had a "fit." He was a male baby, 5 months old, was farmed out, and had only been with the present people about a month. So far as could be made out the following was his history. He was bottle-fed after the first month, but had always been healthy except that for the last six weeks the bowels had been irregular, chiefly constipated, though for a week previous to the attack he had had slight diarrhoea and seemed to have pain when his bowels acted. About 5.30 p.m., when he was having his bottle before being put to bed, he took a little of the feed and then cried, took a little more and cried again, and then finished the bottle. Almost immediately he became sick and brought up most or all of the feed, which was said to be in the same state as when swallowed. As this had soaked his nightdress he was laid down to have it changed, but he suddenly became pale and unconscious.

While the people were waiting for a doctor to come he was put in a warm bath and then rolled in a blanket, but he did not show any signs of reviving and gradually got colder. Once or twice he was supposed to be dead, and they were not quite certain if he were alive when I came.

On my arrival, about half an hour after the attack commenced, I found him quite limp, the head and limbs falling about when he was moved; he was cold all over, extremely pale, no pulse to be felt; the eyes were partly open and the conjunctivæ insensible to touch. There were slight sighing respirations at intervals, but no other signs of life. I do not remember auscultating the heart.

I put him in a hot bath and splashed cold water in his face, while a blanket and flannels were being heated, and when they were ready he was dried and laid on a warm