On Irregularity of the Pupils from Central Causes, being the substance of a Paper communicated to the Psychiatrical Section of the Philosophical Association of Germany, by Dr. Reichardz, of Eudenick, near Bonn. Translated from the "Allgemeine Zeitschrift für Psychiatrie, —1858.

In describing the relative sizes of unequal pupils in the diseases of the central organ of the nervous system (as in incomplete general paralysis) most observers make special mention of the dilated pupil, and, under precisely similar essential conditions, we more frequently find one pupil characterised as being larger than the other, than the converse. Were there no prejudice at the bottom of this custom, there might be nothing to advance against it; but I believe that the views on which it is founded, are, more or less, conjectural. It is apparently assumed, in the first place, that inequality of the pupils is always caused by lesion of one iris only; that dilatation of the pupil is more truly and more frequently a morbid condition, than contraction; and, finally, that dilatation is always dependent on relaxation, resulting from paralysis. The iris, with the dilatated pupil is, thus, more often pointed out as being affected, and that with paralysis, than the one in which the pupil is contracted; and we find, moreover, that it is quite usual to adduce, not perhaps, mere inequality, but dilatation of the pupils generally, as an absolute sign and example of paralysis of single muscles.

These hypotheses—certainly not always clearly understood—are, however, completely false. It must be remembered, that both abnormal dilatation, and abnormal contraction, may each arise from two totally different conditions of iris—the dilatation, either from paralysis of the circular or spasm of the radiated fibres; and the contraction, either from paralysis of the radial or spasm of the circular fibres. So that, both irides may be affected, although as a rule, only one of them is found to be so. Whether lesion is present in both or only in one, and in the latter case, in which, can only be ascertained by careful observation. I have noticed, for example, that the difference in size between the pupils in cerebral disease, does not usually remain the same under all conditions of light; also, that this difference will not probably be at its maximum under a moderate amount of illumination, but under the influence, either of a very strong or a very feeble light; and that under the opposite extreme, it falls to a minimum, or, indeed, disappears altogether. I speak, of course, only of relative difference, not of absolute, for the latter must naturally be less when the pupils are contracted, than when they are dilated. This, which is the usual demeanour of unequal pupils, under various stimulus of light, can only be explained by regarding the lesion as being limited to one iris, and proves, indeed, that such is ordinarily the case. The skilful em-

ployment of rapid alternations of very strong and very feeble light, by which only, the investigation can be made with exactitude, is, hence, a very proper and sound mode of diagnosis.

From the application of this test, the following possible cases result, including one, however, which for the most part, is non-pathological.

I.—If, under varied amounts of illumination, the proportional difference between the pupils remains unaltered, while, at the same time, their absolute size varies, in ratio to the strength of the light, both irides must be considered sound, and the inequality of the pupils regarded as arising from simple 'vitium,' or, at least, not as central, and not as depending on paralysis or spasm.

II.—If, under the influence of different degrees of light, the proportional difference between the pupils, and also their absolute size, remains wholly or nearly unaltered, both irides must be considered seriously and equally diseased—that with the larger pupil, either from paralysis of the circular, or spasm of the radial fibres, and that with the smaller pupil, either from paralysis of the radial or spasm of the circular fibres. Four possible cases occur here, from combination, viz :—

1.—Paralysis of the circular fibres in the larger pupil, with paralysis of the radial in the smaller (the most frequent);

2.—Paralysis of the circular fibres in the larger pupil, with spasm of the circular fibres in the smaller;

3.—Spasm of the radial fibres in the larger pupil, with paralysis of the radial fibres in the smaller;

4.—Spasm of the radial fibres in the larger pupil, with spasm of the circular fibres in the smaller.

III.—The last and most frequent occurence is, that the inequality of the pupils nearly or wholly disappears, either under a very powerful or very feeble impression of light. In this case, only one iris is affected.

1.—If the inequality disappears under the influence of a powerful light, it can only be due to the contraction of the larger pupil, while, at the same time, the smaller pupil is not at all, or not equally excited to contraction by the increased stimulus. We have, then, here the larger pupil, pertaining to an iris, which is obedient to changes of light, or, in other words, sound; and the smaller, fixed, or imperfectly mobile pupil pertaining to an iris in a state of disease from—

(a)—Paralysis of its radial fibres, by which the antagonistic circular fibres, which produce contraction of the pupil, obtain preponderance, or

(b)—Spasmodic contraction of its circular fibres.

2.—If the inequality of the pupils disappears, on the other hand, under a very feeble light, this can only be produced by dilatation of the smaller pupil, whilst, at the same time, the larger pupil remains uninfluenced by the diminution of light, or does not dilate

in equal measure. Here the smaller pupil pertains to an iris obedient to light, *i. e.*, healthy; and the larger fixed, or imperfectly mobile pupil to an iris, in a condition of disease from—

(*a*)—Paralysed circular fibres, by which their antagonists, the radial fibres, obtain preponderance, or

(*b*)—Spasmodically contracted radial fibres.

There are thus, in all nine, or if the first (non-pathological) is omitted, eight possible cases of inequality of the pupils. When the inequality continues with a certain constancy, the question of spasm can scarcely be entertained. In irides, however, which are equally and similarly affected, chronic spasmodic contraction is not unfrequently observed. The persistent dilatation of the pupils in Helminthiasis cannot be explained as proceeding from paralysis, but as due to spasmodic contraction of the longitudinal fibres ot the iris, from irritation of the sympathetic nerve. Inequality of the pupils, arising from spasm of the radial fibres of one iris, combined with spasm of the circular fibres of the other is rare; but most rare is the occurrence of inequality through paralysis in one iris, with spasmodic contraction of the corresponding muscular fibres in the other.

If, from the above eight possible conditions, all cases of a spasmodic character, be withdrawn, as is mostly necessary in general paralysis, there will remain only three for consideration, viz :—

1.—Paralysis of the radial fibres of the iris with the smaller pupil.

2.—Paralysis of the circular fibres of the iris with the larger pupil.

3.—A combination of 1 and 2 with each other.

The last of these is the least frequent in incomplete general paralysis. In this disease, a single iris is much more often affected with paralysis than both, so that, independently of the general palsy, something of an hemiplegic character is usually present. I have further noticed that, when the irregularity disappears under one of the extremes of illumination, it more frequently takes place under the strongest, than under the weakest light; so that, contrary to what is generally supposed, the defect is oftener in the contracted pupil, than in the dilated one. This fully harmonizes with the observation of Budge ("Movements of the Iris, &c.") that the 'nerv. oculomotorious,' which is known to be the excitor of the 'musc. sphincter irid.,' developes much more nervous force, and can be thrown into activity by a far less amount of stimulus than the 'nerv. sympath.,' which supplies the dilator muscle. It is, therefore, cœteris paribus, far more likely in general palsy, that paralysis occur in the nerves and muscular apparatus subserving the contraction of the pupil, than in those which effect its dilatation. In this regard, the dilator and sphincter muscles of the iris hold the same relation to each other, as the extensors and flexors of the limbs.

Moreover, in inequality of the pupils resulting from central paralysis, the knowledge whether both irides are effected or only one—whether, namely, the longitudinal fibres, supplied by the 'sympathetic', or the radial fibres supplied by the 'oculomotorous,' are paralysed—cannot but be of great importance in the diagnosis of the central seat of lesion.

EDWARD PALMER.

OBITUARY NOTICE OF DR. JACOBI.

(From the Cologne Gazette, 19 *and* 20 *July,* 1858. *By* Dr. Focke.)

Karl Wigand Maximilian Jacobi, the founder, and for many years superior of the Lunatic Hospital at Siegburg, was the youngest son of the philosopher Friedrich Heinrich Jacobi, and was born at Düsseldorf on the 10th of April, 1775.

He received his education under a tutor (H. Schenk afterwards Privy Councillor at Munich); and at the Gymnasium at Düsseldorf. Thus well prepared he devoted himself to the study of medicine, entered the University at Jena in the spring of 1793, and attached himself to the body of youth who surrounded the newly-established professorial chair of Hufeland. This distinguished man took a fatherly interest in him, and exerted a permanent influence on both his disposition and his studies. He was also much noticed by Göethe, who often visited him "to renew his acquaintance with anatomy." Jacobi quitted Jena in 1795, completed his studies at Göttingen and Edinburgh, and graduated at the University of Erfurth, on the 21st February, 1797. His father, exiled by the revolution, had emigrated to Holstein, where he was on very intimate terms with Matthias Claudius, to whose daughter the young doctor was married in 1798. He settled as a physician, first at Baels, near Aix la Chapelle; and subsequently, in 1800, at Eutin. But, as in country practice the doctor is called upon to ply all branches of his profession, he soon became painfully aware how insufficient was his acquaintance with surgery; and, to supply this defect, repaired with his family in 1802 to London for a year and a half, where he acted as assistant at one of the hospitals. Returning to Eutin, he left it again in 1806; and, following his father to Munich, entered the Civil Service of Bavaria. He was ap-