SCIENTIFIC SERIALS

THE *Journal of Mental Science*, April, 1876.—Reflex, automatic, and unconscious cerebration, a history and a criticism, by Thomas Laycock, M.D., is continued and completed in this number. The paper is very interesting. Dr. Laycock takes great pains, and is, we think, successful in making good his claim to priority over Dr. Carpenter in certain views of an advanced nature, which, if they are not already, will soon be entirely absorbed in others much more advanced.—Dr. John M. Diarmid writes in high praise of morphia in the treatment of insanity, when administered subcutaneously.—Dr. Daniel Huck Tuke gives an historical sketch of the past asylum movement in the United States, doing full justice to the enlightenment and humanity of American physicians, while recording the outstanding difference between them and their English brethren in the principle and practice of non-restraint.—A modest but suggestive paper on the use of analogy in the study and treatment of mental disease, is contributed by Dr. J. R. Gasquet.—Dr. P. Maury Deas describes a visit to the Insane Colony at Gheel, where the accumulating experience of a thousand years has produced an instinctive aptitude to manage the insane worth more in practice than the best of our consciously-formed systems.—Dr. Isaac makes some interesting observations on general paralysis.—"Arthur Schopenhauer: his Life and his Philosophy," by Helen Zimmern, is reviewed in a manner worthy the book and its subject.—The *Journal* contains other reviews, clinical notes and cases, news, &c.

Zeitschrift der Oesterreichischen Gesellschaft für Meteorologie, Feb. 1.—In this number appears the first part of a paper by Dr. W. Köppen, on the yearly periods of probability of rain in the northern hemisphere. It is accompanied by a valuable diagram of curves. He begins by calling attention to the value of the system on which his calculations are based, namely, the mere registration of the days of which rain falls in each locality. Considering that in our latitudes changes of vapour tension and of relative humidity do not concur, it is simpler than measuring the quantity of rain or snow. The probability of a downfall depends upon two conditions, the degree of relative humidity between, say 100 and 3,000 metres altitude, and the favourable or unfavourable circumstances for the formation of an ascending current, or, firstly, on the rate of decrease of temperature with height; secondly, on the slope of the ground towards the direction of the wind, while the quantity depends also on the quantity of vapour contained in a volume of air, and so, *cœteris paribus*, on the temperature. He then gives a detailed account of the authorities from whom he has derived his materials. The selected stations are well distributed over the greater part of the northern hemisphere, including the North Atlantic, and have most of them afforded records during more than ten years. As in his former writings on the subject, he represents graphically the means of groups of neighbouring stations having similar annual distribution of rainfall, but annexes a table showing the actual numbers for each station. The diagram exhibits the probability of rain in each month for each district.

Feb. 15.—In this number Dr. Köppen concludes his remarks on the yearly periods of probability of rain. The paper, which is illustrated by elaborate tables, contains much valuable information respecting the times of year at which rain is most and least probable in a great number of countries and districts of the northern hemisphere.

Gazzetta Chimica Italiana, Anno VI., 1876, Fascicolo I.—Synthesis of the sulpho-tannic acids, by Hugo Schiff. The author in this paper treats of phenol-sulphuric anhydride, trichlorhydroquinone-sulphuric acid, sulphopyrogallic acid, sulphotannic and pentacetosulphotannic acids, the sulpho-acids of phoroglucin, &c.—On the elasticity of metals at different temperatures, by G. Pisati. In this paper the author investigates the elasticity of iron and steel, arriving at the following formula:—

$$K = \frac{P.L_0 (1 + \alpha t)}{\pi r_0^2 (+ \alpha t)^2 . l} = \frac{P.L_0}{\pi r_0^2 . l} . \frac{1}{1 + \alpha t}$$

where K is the modulus of elasticity of stretching force, P the weight which acting on the length of wire L, produces the lengthening l, α is the co-efficient of linear expansion.—Modification of the process for the extraction of alkaloids in poisoning of the viscera, by F. Selmi.—On a method of detecting traces of phosphoric acid in toxicological researches, by F. Selmi.—On the use of phyllocyanine as a reagent, by Guido Pellagri.—Action of iodide of allyl and zinc on oxalic ether, by E. Paterno and P. Spica.—Chemical researches upon twelve coloured solids found at Pompeii.—The remainder of the part is occupied by extracts from foreign journals.

SOCIETIES AND ACADEMIES

LONDON

Royal Society, May 4.—"On the Origin of Windings of Rivers in Alluvial Plains, with Remarks on the Flow of Water round Bends in Pipes," by Prof. James Thomson, LL.D., F.R.S.E. Communicated by Prof. Sir William Thomson, F.R.S.

In respect to the origin of the windings of rivers flowing through alluvial plains, people have usually taken the rough notion that when there is a bend in any way commenced, the water just rushes out against the outer bank of the river at the bend, and so washes that bank away, and allows deposition to

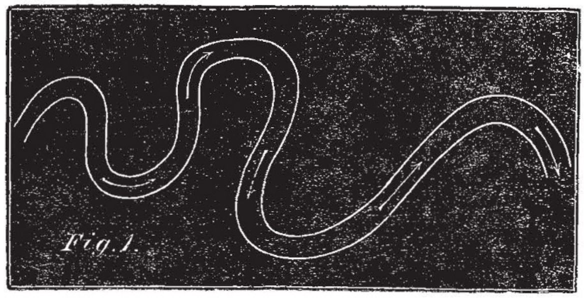

Fig. 1.

occur on the inner bank, and thus makes the sinuosity increase. But in this they overlook the hydraulic principle, not generally known, that a stream flowing along a straight channel and thence into a curve, must flow with a diminished velocity along the outer bank, and an increased velocity along the inner bank, if we regard the flow as that of a perfect fluid. In view of this principle, the question arose to me some years ago, *Why does not the inner bank wear away more than the outer one?* We know by general experience and observation that in fact the outer one does wear away, and that deposits are often made along the inner one. *How does this arise?*

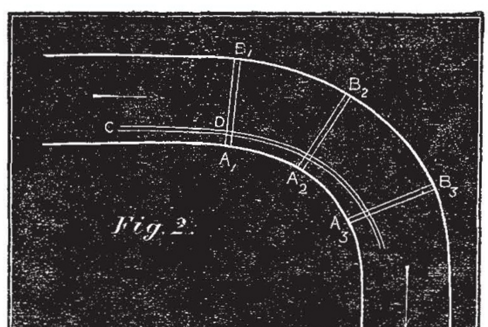

Fig. 2.

The explanation occurred to me in the year 1872, mainly as follows:—For any lines of particles taken across the stream at different places, as A_1B_1, A_2B_2, &c., in Fig. 2, and which may be designated in general as AB, if the line be level, the water pressure must be increasing from A to B, on account of the centrifugal force of the particles composing that line or bar of water; or, what comes to the same thing, the water-surface of the river will have a transverse inclination rising from A to B. The water in any stream line CDE[1] at or near the surface, or in any case not close to the bottom, and flowing nearly along the inner bank, will not accelerate itself in entering on the bend, except in con-

[1] This, although here conveniently spoken of as a stream-line, is not to be supposed as having really a steady flow. It may be conceived of as an average stream-line in a place where the flow is disturbed with eddies or by the surrounding water commingling with it.