SCIENTIFIC SERIALS

POLLI'S *Annali di Chimica applicati alla Medicina* (No. 1, 1870) has a long preface relating to *miasma palustre* and the use of febrifuges; these topics being discussed in view of the competition for which the Royal Institute of Lombardy has offered a prize in 1872. The competition is restricted to a discussion of the use of sulphites and hyposulphites in intermittent fevers. The editor adds to his preface a list of thirty-seven memoirs which have been published on these subjects between 1863 and 1869. Carlo Pavesi contributes a note on a speedy method of preparing mercurial ointment, in which the use of oil of turpentine as an ingredient is specially recommended. Belardi draws attention to the fact that pharmaceutical preparations of bismuth are liable to contain antimony. Pagano gives an illustration of the therapeutic value of magnesic sulphite; and Moretti records some clinical observations on the use of the same salt as well as sodic sulphite.

THE *Moniteur Scientifique* (January 15th) contains an unnecessarily tedious article on Sodic Bromide, by Casthélaz, which does not contain any original matter. M. E. Kopp contributes extracts from foreign journals (practical chemistry). M. J. Personne compares the process of Roussin for preparing hydrated chloral, which he condemns as imperfect, with that given in Dumas' *Traité de Chimie*, which he eulogises (it yields 185 per cent.) M. Jonglet reports ably on the progress of the sugar industry in France.

THE *Astronomische Nacrichten*, No. 1788, January 19, 1870, contains (1) Observations with the Reichenbach Circle at the Warsaw Observatory, by C. Deike, Second Assistant at the Observatory; (2) Observations of Comet III., 1869, by Argelander; (3) and (4) Elements and Ephemeris of the same Comet, by Bruhns and Von Littrow. Von Littrow states that the comet will hardly be visible after the end of January, as its brilliancy on 13th January only amounted to one-fifth the brilliancy at the time of its discovery. The fifth paper in the present number is by Peters, and gives Elements and Ephemeris of Felicitas (109) from January 30th to 22nd March. In the sixth and last paper Dr. Oppolzer communicates a definitive determination of the orbit of the planet (64) Angelina.

Annales de Chimie et de Physique, January.—M. Achille Cazin contributes a memoir on "internal work in gases." It contains a theoretical discussion and an experimental proof of such work, the latter being in principle a repetition of Joule's experiment, in which air is allowed to flow from a full into an exhausted receiver. M. Boussingault determines carbon in iron by mixing the filings with mercuric chloride and a little water, allowing the mixture to repose in contact with aqueous hydric chloride for about an hour, filtering and igniting the precipitate (carbon, mercurous chloride, &c.) in hydrogen. Successive ignitions in air and hydrogen then give the *combined* carbon; successive ignitions in oxygen and hydrogen next give the graphite. This number also contains an unfinished paper, by M. Vicaire, on the "temperature of flames and dissociation."

SOCIETIES AND ACADEMIES

LONDON

Royal Society, January 27.—The following papers were read: "Observations on the temperature of the strata taken during the sinking of the Rose Bridge Colliery, Wigan, Lancashire, 1868-69." By Edward Hull, M.A., F.R.S., Director of the Geological Survey of Ireland. The manager of the Rose Bridge Colliery, Mr. Bryham, sensible of the value of observations of the temperature of the strata in what is probably the deepest colliery in the world, certainly in Britain, made a series of observations with as much care as the circumstances of the sinking of the shaft would admit, and entrusted them to Mr. Hull for publication. The mode of taking the observations was as follows:—On a favourable stratum, such as shale, or even coal, having been reached, a hole was drilled with water in the solid strata to a depth of one yard from the bottom of the pit. A thermometer was then inserted for the space of thirty minutes, the hole having been sealed and made air-tight with clay. At the expiration of the half-hour the thermometer was taken up and the reading noted. While the temperatures of the strata were being measured, observations were carried on *pari passu* on those of the open pit during the descent. These are given in the Table annexed. By a comparison of the results in the two columns, it will be observed that, as the depth increased, the differences between the corresponding temperatures in the pit and the strata tended to augment; in other words, the temperature of the strata was found to augment more rapidly than that of the open pit. The effects of the high temperature and pressure on the strata at the depth of 2,425 feet are making themselves felt, and cause an increase in the expense both of labour and timber for props. This colliery, in fact, will be in a position to put to the test our views and speculations on the effects of high temperature and pressure on mining operations. In order to obtain the average rate of increase of heat, as shown by the experiments at Rose Bridge Colliery, we may assume (in the absence of direct observation) the position and temperature of the *invariable stratum* to be 50 feet from the surface and 50° F., which is probably nearly the mean temperature of the place. With these data, the increase is 1° F. for every 54·57 feet, which approximates to that obtained by Professor Phillips at Monkwearmouth of 1° F. for about every 60 feet. If, on the other hand, for the purpose of comparison, the measurements for the *invariable stratum* as obtained at Dukenfield be adopted, the rate of increase is found to be 1° F. for every 47·2 feet as against 1° F. for every 83·2 feet in the case of Dukenfield itself. So great a discordance in the results is remarkable, and is not, in the opinion of the author, attributable to inaccuracy of observation in making the experiments. On the other hand, he suggests that it is due, at least in some measure, to dissimilarity in the position and inclination of the strata in each case.

THERMOMETRICAL OBSERVATIONS AT ROSE BRIDGE COLLIERY.

Date.	Depth, in yards.	Strata.	Temperature in open pit.	Temperature in solid strata.
			F. °	F. °
July 1854	161	Blue shale	...	64·5
August 1854	188	Warrant earth	...	66
May 1858	550	Blue shale	...	78
July 1858	600	Warrant earth	...	80
May 18, 1868	630	"Raven" coal	73	83
July 24, 1868	665	Linn and wool	75	85
April 29, 1869	673	"Yard Coal" mine	76	86
November 18, 1868	700	Strong Blue Metal	76	87
February 22, 1869	736	Do.	76	88¼
March 12, 1869	748	Shale	77	89
April 17, 1869	762	Linn and wool, or strong shale	78	90·5
May 3, 1869	774	Strong shale	80	91·5
May 19, 1869	782	Blue metal	79	92
July 8, 1869	801	Strong blue shale	79	93
July 16, 1869	808	Coal (Arley mine)	79	93½

Remarks.—All holes vertical in solid at bottom of pit drilled with water one yard deep, and thermometer remained thirty minutes in hole made air-tight with clay.

"On the Theory of Continuous Beams." By John Mortimer Heppel, Mem. Inst. C.E. Communicated by W. J. Macquorn Rankine, F.R.S. The chief object of this communication was to remedy some acknowledged defects in the theory of the above-mentioned subject. The principal steps by which it has reached its present state of development were also noticed, and may be briefly recapitulated as follows:—The great defect in the theory up to the present time has been that, in order to avoid an inextricable complexity, it has been necessary to consider the load in each span as uniformly distributed over it, and the moment of inertia of the section as uniform throughout each span. The method now given treats these conditions rigorously; and although the equations obtained are such as necessarily require some laborious computation to obtain numerical results, they are by no means inextricable.

"Remarks on Mr. Heppel's Theory of Continuous Beams." By W. J. Macquorn Rankine, C.E., LL.D., F.R.S. The author states that the advantages possessed by Mr. Heppel's method will probably cause it to be used both in practice and in scientific study. With a view to the instruction of students in engineering science, he proposes an abridged way of stating the theoretical principles of Mr. Heppel's method, considering at the same time that Mr. Heppel's more detailed investigation forms the best model for numerical calculation. He then uses Mr. Heppel's improved form of the "Theorem of the Three Moments" to test the accuracy of the formulæ which he obtained in another way, and published in "A Manual of Civil Engineering," for the case of an uniform continuous beam with an indefinite number of equal spans, the successive spans being loaded alternately with an uniform fixed load only, and with an uniform