which the oyster was attached has usually disappeared, except in those cases in which it was attached to one of its own species. More than half of the specimens have the two valves united and free from adhesions, so that they are capable of exhibiting the phenomenon referred to. More than nine-tenths of these show more or less clearly in the upper valve the figure impressed upon the lower valve by the shell to which the latter adhered.

In most cases this is the figure of a part of the outer surface of a bivalve shell. In a few it is the inner surface of a bivalve shell. In one oyster the figure of part of a specimen of *Cerithium magnirostratum*, Conrad, is clearly shown above and below; in another, *Cerithium libanoticum*, Fraas, with a much better outer lip than is usually found in specimens of the original shell. In two cases the internal cast of a small *Cerithium*, together with some of the matrix, still adheres to the lower valve of the oyster, while its external form, lost below, is beautifully reproduced upon the upper valve.

In two very striking instances, the lower valve of the oyster shows the impression of a bivalve shell with spiny ribs, while a reproduction of these same spiny ribs appears in high relief upon the upper valve. These reproductions in the upper valve of figures impressed upon the lower valve might be supposed to result from the close contact of two valves when both valves were thin and small, and might be expected to be confined to the region of the umbo in well-grown specimens; but in all cases in which the oyster has been attached by a large portion or all of the lower valve, the impression is reproduced upon a correspondingly large portion of the upper valve. In view of the fact that in most specimens the shell is from 1.5 to 2 cm. thick, and, further, that internal surfaces when exposed show no traces of these external markings, it is noteworthy that the markings should extend over so much of the upper surface instead of being confined to the umbonal region.

ALFRED ELY DAY.

Syrian Protestant College, Beirut, Syria, September 22.

THE peculiar phenomenon referred to in the above letter is well known to occur among Secondary fossils, and has been fully explained by Prof. J. W. Judd in the *Geological Magazine* for 1871, p. 385, where several figures of Oolitic forms are given in illustration. The same peculiarity is also seen in certain oysters from the Lias. The thin growing edge of the shell adapts itself to the inequalities of the surface upon which it grows; the upper valve, being also thin, reproduces the form of the lower valve. The shell becomes thickened by additional layers on the inside, which thus gradually loses the markings that are retained upon the outer surfaces.

E. T. N.

Refractivities of the Inert Gases.

A RELATION appears to exist between the refractivities ($\mu-1$) of the inert gases of the atmosphere and that of hydrogen, which, so far as I am aware, has hitherto escaped attention. The following figures show that, taking the refractivity of hydrogen as 1, the refractivities of the other gases are very nearly in the proportion of $\frac{1}{4}$, $\frac{1}{2}$, 2, 3 and 5.

By far the largest divergence is in the case of helium. This gas, as I am informed, is difficult to purify from the admixture of the heavier gases, so that a perfectly pure specimen would probably give a better result. Even if the relation to hydrogen is fortuitous, the ratios of the refractivities of the other five gases to one another are sufficiently interesting.

Refractivities ¹ observed (Air=1).	Ratio to H.	Calculated from H=0.4733.	Error per cent.
Helium	$\frac{1}{4}$	0.1183	-4.4
Neon	$\frac{1}{2}$	0.2366	+0.9
Hydrogen	1		
Argon	2	0.9466	-2.2
Krypton	3	1.420	-2.0
Xenon	5	2.367	+0.1

CLIVE CUTHBERTSON.

9 York Terrace, Regent's Park, N.W., October 10.

¹ Ramsay and Travers, *Phil. Trans.*, vol. cxcvii. A, 1901, p. 47.

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Trade Statistics.

IN his reply to my letter (October 2, p. 550), Dr. Mollwo Perkin brings forward fresh figures, apparently proving an enormous decline in British industry since 1870-74. This, however, is but to repeat Mr. Levinstein's mistake in an aggravated form. The Franco-Prussian war in 1870 checked manufacturing abroad for a twelvemonth, and in 1870-74 there was a heavy demand for British iron and coal at excessively high prices. That period, as is well known, is useless for comparisons of British and German export trade.

It is true, as Dr. Perkin points out, that the general rate of increase of exports (*i.e.* of their total values irrespective of the number of producers) has, in the last twenty years, been very slow in this country, rather rapid in Germany and very rapid in the United States.

But if we reckon per head of population, we get the following (from the Board of Trade "Memorandum," "Cd. 1199") :—

Annual Exports ("Special") per head of Population.

Average of period.	United Kingdom.	France.	Germany.	United States.
1875-79	£ 6.00	£ 3.75	£ 3.15	£ 2.81
1880-84	6.66	3.67	3.43	3.30
1885-89	6.18	3.46	3.27	2.59
1890-94	6.15	3.57	3.14	2.95
1895-99	5.97	3.73	3.36	2.92

These figures are distinctly reassuring. They must not be used as an excuse for laxity in education or the application of science to manufacture, but they ought to allay unreasonable pessimism.

The slight decline per head in the British exports (as measured in money, not in commodities) would be a rather unsatisfactory feature if the export trade were our chief trade and chief source of income. Dr. Perkin perhaps thinks that it is, for he translates Mr. Levinstein's "foreign trade" into "trade." But the gross value of the export trade (280 or 300 millions per annum), large as it is, is small compared with the total national income, recently estimated by Sir Robert Giffen at 1500 millions sterling, while the income-tax assessments indicate that it is increasing faster than the population (*Times*, May 23, 1901). This enormous income is, of course, chiefly made up of the value of goods produced and consumed within the country, constituting the internal trade as distinguished from the foreign trade. From this point of view a close scrutiny of export statistics appears to be unnecessary, and may easily be misleading.

Unfortunately, we have no adequate statistics of total production. The figures for pig iron which Dr. Perkin gives are to the point, and the progress of our two great rivals is here very striking. But the pig-iron manufacture accounts for less than 3 per cent. of our national earnings.

F. EVERSHED.

Kenley, Surrey, October 10.

Material for Natural Selection.

*Verbesina exauriculata*¹ is an evil-scented but handsome herbaceous plant with broad orange rays, very abundant in the town of Las Vegas, New Mexico. My class in biology has been making a study of the variations in the number of rays in the heads of this plant, and in so doing we took occasion to compare two sets, from the eastern and western parts of the town respectively. The result was as follows, calling these sets A and B respectively :—

Number of Rays.	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)
Number of heads, set A.	—	—	7	7	31	63	96	30	19	13	7	9	7	3	2.
Number of heads, set B.	1	6	10	19	32	73	84	25	12	5	2	1	—	1	—.

¹ *Verbesina encelioides exauriculata*, Robinson and Greenman, *Proc. Amer. Acad.*, May, 1899, p. 544. Notwithstanding the name of this northern type, the petioles of the upper leaves are commonly strongly auriculate.

It will be seen that the mode is the same in each case, but the means are very different. To ordinary observation, the two sets of flowers looked exactly alike, and the demonstration of a difference in the average, while not at all extraordinary, is interesting. No doubt such differences exist in all organisms and all characters, and one can easily see how, under certain circumstances, they may have an important bearing upon the question of survival. The great variability no doubt indicates that the number of rays is *not* at present of much importance to the *Verbesina*; and no doubt those organs which have become variable for this reason, but suddenly become of importance through changed conditions, afford the best material for selection. In other words, evolution will proceed fastest when there are changes in the survival-value of organs. While examining the *Verbesina*, I found on the undersides of the leaves a new species of spinning mite (*Tetranychus verbesinae*); a little creature about half a millimetre long, pale yellowish, with two scarlet spots on the anterior part of the body, and irregular black spots (pertaining to the soft parts) arranged somewhat in the form of a crescent. The first pair of legs is somewhat more than half the length of the animal; mandibular plate with the sides as in *T. gloveri*, but the end rounded; hairs of body moderate, on very small tubercles. Further particulars will be given elsewhere.

T. D. A. COCKERELL.

East Las Vegas, New Mexico, U.S.A., September 17.

THE INTERNATIONAL METEOROLOGICAL COMMITTEE.

IF we come to consider the work of the International Meteorological Committee and its predecessor, the Permanent Committee of the Vienna Congress, it will be impossible to deal with the subject without taking notice of all the meetings, whether Congresses or Conferences, from which the committees above named took their rise.

It may here be explained that Congresses are convened through diplomatic channels; Conferences are brought together by private invitation to meteorologists of repute.

The first attempt to convene an international meeting was in 1845, when a Conference was held at Cambridge on the occasion of the meeting of the British Association in that year. This was attended by Dove, Kupffer, von Lamont, Adolph Erman and some other foreigners, and of course by the leading meteorologists of England. The difficulties in introducing uniformity in land observations were found to be too serious for definite arrangements to result.

This was followed, in 1853, by the Brussels Conference, which was instigated by Maury. It dealt with the Meteorology of the Sea, and its action met with general acceptance among maritime nations. It may be said that our own Meteorological Office was an outcome of this Conference.

In 1863 Dove endeavoured to convene a Conference on Land Meteorology. At the meeting of the Swiss Naturforscher Verein, he invited the meteorologists of Austria, France, Italy and Spain, but the invitation was not generally accepted.

Nothing definite, however, was done for Land Meteorology until Weather Telegraphy took its rise, about the year 1860, when the demand from each nation for regular intelligence from adjacent countries rendered it impossible for any Government to ignore the subject absolutely. Still, however, every country continued to deal with its Climatology as seemed right in its own eyes.

This was the state of affairs when, in 1872, Profs. Bruhns (Leipzig), Jelinek (Vienna) and Wild (St. Petersburg) issued a general invitation to a Conference, to be held at Leipzig coincidentally with the meeting of the German Naturforscher Verein. This Conference was a signal success. It was attended by 52 members, and from it all subsequent meetings took their rise.

There have been in all seventeen of these meetings.

1872. Leipzig, Conference.	1882. Copenhagen, meeting of I.M.C.
1873. Vienna, Congress.	1885. Paris, meeting of I.M.C.
Do. First meeting of Permanent Committee.	1888. Zurich, meeting of I.M.C.
1874. London, Maritime Conference.	1891. Munich, Conference.
Utrecht, meeting of P.C.	1894. Upsala, meeting of I.M.C.
1876. London, meeting of P.C.	1896. Paris, Conference.
1878. Utrecht, meeting of P.C.	1899. St. Petersburg, meeting of I.M.C.
1879. Rome, Congress.	1901. Paris, meeting of I.M.C.
1880. Berne, meeting of Int. Met. Committee.	

An elaborate *résumé* of the resolutions at all the meetings, down to the Munich Conference, was printed by the late Prof. Wild in vol. xvi. of his "Repertorium für Meteorologie."

In dealing with the action taken at these several gatherings, it is found that many of the resolutions passed at early meetings were materially modified on subsequent consideration, and this is especially the case with reference to instruments and their observation. It is therefore proposed to mention only the final outcome.

The Barometer.—The use of aneroids as independent instruments was condemned, and it was decided that all standard barometers, at Central Offices, should be compared with the standard barometers of the Bureau International des Poids et Mesures at Paris.

As regards barometer corrections, the readings in climatological tables are to be given unreduced to sea level. It is desirable to apply the Gravity correction, and at all events it is to be stated in the tables if this correction has been applied or not, and what is its amount.

The Thermometer.—In this case too the standards at Central Offices are to be compared with the standard air thermometer of the Bureau International.

No recommendation has been made on the subject of thermometer exposure, owing to the impracticability of meeting the requirements of all climates. Meteorologists are referred to the published papers on the subject by Wild and others.

The desirability of devising a really good maximum thermometer was expressed. As regards minimum thermometers, the use of amyl alcohol instead of ordinary spirit was recommended.

Maximum and minimum thermometers are to be read at the latest observing hour of the day.

Humidity.—This subject was treated at considerable length, and the employment of ventilation with the wet bulb was urgently insisted on. At the meeting of St. Petersburg, Prof. Penner proposed to abandon the use of the dry- and wet-bulb hygrometer, and to revert to the use of the hair hygrometer, but the proposal was not adopted.

Wind.—No general form of anemometer was recommended, nor was any action taken as to uniformity of installation or of altitude. As to wind direction, the English letters N. E. S. W. were adopted owing to the misunderstandings caused by the use of "O" for "Ost" in German and for "Ouest" in French.

Clouds.—At the Munich Conference, the international scheme of Cloud Observations, Direction and Velocity, for one year, was adopted, and the results of this work have appeared. At the same meeting, the Classification of Clouds proposed by Abercromby and Hildebrandsson was adopted, and from that has come the "International Cloud Atlas."

Rain.—It was decided to place rain gauges in such positions as should preclude their being buried in snow or exposed to splashing from the ground. It was recommended to mark especially the days of precipitation which did not reach the limit of 1 mm. and to ignore falls below 0.1 mm. Two columns are to be given