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lands "for his discovery of the Periodic Law of the Chemical Elements," adding, "Although in the somewhat less complete form in which the law was enunciated by him, it did not at the time attract the attention of chemists, still, in so far as the work of the two foreign chemists above mentioned was anticipated, the priority belongs to Mr. Newlands" (*vide* Proceedings of the Royal Society of London, 1887-'88, vol. 43, p. 195).

Even Newlands was almost anticipated by Beguyer de Chancourtois, who was catching a gleam of the great truth enunciated by Newlands, and elaborated by Mendeléef, when he brought out his treatise in 1863, entitled, "Vis Tellurique, classement naturel des corps simples ou radicaux, obtenu au moyen d'un système de classification hélicoïdal et numérique."—Yours truly, C. DE K.

New York, February 5, 1892.

[If our correspondent will read carefully what the Council of the Royal Society say about Newlands, he will see that they do not commit themselves very far. In truth, the step taken by him was not a difficult one. The principal precursor of Mendeléef was, as it seems to us, that penetrating intellect, Josiah P. Cooke, who first proved that all the elements were arranged in natural series. For though his classification was not free from uncertainties, which have since been removed, nor from such mistakes as the association of borax and silicon according to the ideas of that day, yet his memoir could leave no real doubt of the general serial arrangement; and this was a great advance upon what Dumas and others had done. After the new atomic weights came in, it was inevitable that every well-informed and ingenious chemist, in speculating upon the relations of the properties and atomic weights of the elements, should be led to write the different series in a certain succession, somewhat as follows:

Li	Na	K	—	Rb	Ag	Cs	
7	23	39		85	107	133	
—	Mg	Ca	Zn	Sr	Cd	Ba	Pb
	24	40	65	87	112	137	206
C	12	16	—	Zr	Su		
12	28	32		90	118		
N	14	18	—	Nb	Sb		Bi
14	31	35		94	122		210
O	16	20	—	Mo	Ta	W	
16	33	37		98	126	184	
Fl	19	35.5	—	Br	I		
				80	127		

It would also be remarked that the atomicities of these series seemed to be i, ii, iv, iii, ii, i. No doubt, many a chemist in those days drew up a table more or less like this, but refrained from publishing it, feeling that a great discovery was imminent. An obscure American chemist actually assigned this as a reason for not attaching his name to such a table. Yet this was all, if not more than all, that Newlands did; and his papers, in a very widely circulated journal, made no sensation.

Of all those who were puzzling over the relations of the elements, Mendeléef alone had the sagacity to discern the true scheme of relationship; and this he was aided in doing by his more profound study of the relations between their general properties. His wonderfully vivid conception of the

its evidence, is shown by the formal and audacious descriptions he gave of the properties of several elements then undiscovered, but required to fill blank spaces, and by the subsequent triumphant verification of his predictions, especially of what seemed the most wild and improbable of all—that relating to gallium. Very few inductions in the whole history of science are worthy of being compared with this as efforts of reason. The work of Lothar Meyer also has great value as supplementary to that of Mendeléef. In all branches of physics, inductions concerning periodic laws are most difficult to establish; and the pursuit of indications of periodicity leads all but the most wary of minds to some wild-goose chase. Yet how quickly and completely the periodic law of chemistry was put out of doubt!

While we are upon this subject, we may suggest that if there are atomicules that are Bosovichian points, two or more of these might attract one another according to such a law that they would approach one another in spirals without ever becoming separated; and in this way it might be supposed that the atoms of most of the existing chemical elements have been built up from a few different kinds, and that it is in this way that the relations between the atomic weights have arisen.

—ED. NATION.]

PROTECTION.

TO THE EDITOR OF THE NATION:

SIR: Your issue of December 17, 1891, contained some pointed remarks with regard to the action of the firm of Jas. W. Queen & Co., in complaining to the Government that certain professional persons were obtaining microscopes, ostensibly for laboratory work, and afterwards selling them to students. Their virtuous indignation over this matter called to my mind a conversation of some months since with a gentleman who told me that he had seen in an English medical journal an advertisement by this firm, offering a case of optical test lenses at a certain price, adding below that the same case was \$15 more in the United States. As they are not known to be in business from purely philanthropic motives, it is probable that this American firm can not only compete with foreign manufacturers of test lenses, but can make a fair profit in so doing. The iniquitous "protective" tariff, however, makes it possible for them to demand and obtain \$15 extra profit from me. OPTICUS.

PHILADELPHIA, February 27, 1892.

TO THE EDITOR OF THE NATION:

SIR: Gen. Walker's suggestion that the Government should charge immigrants \$100 each is offered, I presume, because of the widely diffused conviction that the class of immigrants we have received has debased our political life; but from a protectionist standpoint I do not consider the amount large enough. I am a laboring man, thirty years of age. I earn (say) \$900 per annum, and shall probably continue to do so for ten years, making the value of my labor \$9,000. I pay a tax of from 30 to 100 per cent. on my wearing apparel, furniture, tools, etc.; why should I not be protected by raising my foreign competitor's pay at least

20 per cent. tariff on his \$3,000 worth of goods, or \$600 instead of \$100?—Respectfully yours, THOS. F. ANDERSON.

CHICAGO, February 26, 1892.

SCIENCE IN AMERICA.

TO THE EDITOR OF THE NATION:

SIR: The fine aphorism of Calgacus, "Omne ignotum pro magnifico est," has its obverse in the fact that "Omne proximum pro ignobili est." One would hardly suspect, from reading the interesting and excellent letter of Mr. Stille in your issue of the 11th inst., that the doctrines of the complex variable, of conform depiction—*zusammenhangend und in den kleinsten Teilen ähnlich*—of multiply compendent multifoliate Riemannian surfaces, with their *Windungs- und Verzweigungspunkte, lacets fondamentaux, et id omne genus*, were taught carefully and studied zealously almost within ear-shot of the writer. Yet such is the case. The enclosed conspectus shows that courses in such subjects not only are offered—there is little art in that—but are actually pursued at the University of the State of Missouri. Next year the class will meet not three times, as now, but five times per week, throughout the year, and follow in the fresh tracks of Hermite, Halphen, and Weierstrass. But even Freshman students here are familiarized with $x+iy$ and imaginary exponentials, while for the whole body of geometric discipline the researches of Bolyai, Lobatchevsky, and Riemann are regulative.—Respectfully,

WILLIAM BENJAMIN SMITH.

COLUMBIA, Mo., February 19, 1892.

[We are pleased to learn that mathematics is so deeply studied in Missouri. The lectures of Hermite form a good introduction to the theory, and the work of Halphen to the practical side, of the doctrine of functions. As we are unacquainted with any treatise of Weierstrass capable of being used for a text-book, the study of this author (concurrently, perhaps, with that of the orations of Calgacus) cannot fail to impress us very much. Nothing is said of projective geometry, which ought to be a compulsory study, where there are any compulsory studies; but we cannot expect a relatively small university to cover every branch of mathematics, nor would such an ambitious attempt be wise. We are glad the ideas of Riemann (including doubtless those of Cayley and Klein) are regulative, and that Lobatchevsky is at hand for students who wish to approach the non-Euclidian geometry by the elementary method. Bolyai is a make-weight.—ED. NATION.]

KIRK'S ALLIBONE.

TO THE EDITOR OF THE NATION:

SIR: Had I been aware of your rule not to print rejoinders to your reviews, I should certainly not have had the presumption to claim exemption from it. But since you have published my letter, with a reply which is calculated, however undesignedly, to convey a wrong impression as to the scope of my book and the principles on which it was prepared—a matter not exclusively of personal importance—I must ask the further indulgence of being permitted to offer a brief explanation.