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CHAMBERS'S EDINBURGH JOURNAL, NO. 455

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Chambers's Edinburgh Journal, No. 455

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Chambers's Edinburgh Journal, No. 455 / Volume 18, New Series, September 18, 1852:

Содержание

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A GLANCE AT CONTINENTAL RAILWAYS

When lately making a pretty extensive continental excursion, we were in no small degree gratified with the progress made in the construction and operation of railways. These railways, from all that could be seen, were doing much to improve the countries traversed, and extend a knowledge of English comforts; for it must always be borne in mind that the railway system, with its locomotives, carriages, waiting-rooms, commodious and cheap transit, and other matters, is essentially English. Hence, wherever one sees a railway in full operation, he may be said to see a bit of England. And is not this something to be proud of? The railway being your true civiliser, England may be said to have sent out a missionary of improvement, whom nothing

can withstand. The continent, with all its stupid despotisms, must improve, and become enlightened in spite of itself.

The newspapers lately described the opening of the line of railway from Paris to Strasbourg. Those who know what travelling in France was a few years ago, cannot wonder that Louis Napoleon should have made this the occasion of a popular demonstration. The opening of this line of railway is an important European event; certainly it is a great thing for both France and Germany. English travellers may also think much of it. A tourist can now journey from London to Paris—Paris to the upper part of the Rhine at Strasbourg, going through a most interesting country by the way—then go down the Rhine to Cologne by steamer; next, on by railway to Ostend; cross by steamer to Dover; and, finally, reach London—thus doing in a few days, and all by force of steam, what a short time ago must have been done imperfectly, and with great toil and expense. Still more to ease the journey, a branch railway from the Strasbourg line is about being opened from near Metz, by Saarbrück, to Manheim; by which means the Rhine will be reached by a shorter cut, and be considerably more accessible. In a month or two, it will be possible to travel from Paris to Frankfort in twenty-five hours. All that is wanted to complete the Strasbourg line, is to strike off a branch from Metz to Luxembourg and Treves; for by reaching this last-mentioned city—a curious, ancient place, which we had the pleasure of visiting—the traveller is on the Moselle at the spot where it becomes navigable, and he descends

with ease by steamer to Coblenz. And so the Rhine would be reached from Paris at three important points.

Paris, as a centre, is pushing out other lines, with intermediate branches. Marseille, Bordeaux, Nantes, Rouen, Dieppe, Boulogne, Calais, and Lille, are the outposts of this series of radiation. The latest move is a line from Caen to Cherbourg; it will start from the Paris and Rouen Railway at Rosny, 40 miles from Paris, and proceed through Caen to the great naval station at Cherbourg—a distance of 191 miles from Rosny. By the time the great lines in France are finished —probably 3500 miles in the whole—it is expected that the total expenditure will amount, in round numbers, to a hundred millions sterling.

It is gratifying to know, that the small German powers which border on France have been most active in providing themselves with railways; not only for their own accommodation, but to join the lines of other countries; so as to make great trunk-thoroughfares through their dominions. There seems to be a cordiality in making these junctions, for general accommodation, that cannot but deserve praise. The truth, however, is, that all these petty states are glad to get hold of means for bringing travellers—that is, money-spenders—to their cities and watering-places, and for developing their long-hidden resources. For example, in the district lying between Saarbrück and Manheim, there exist vast beds of coal, and powerful brine-springs; but hitherto, in consequence of being out of the way

of traffic, and there being only wretched cars drawn by cows, as the means of locomotion, this great mineral wealth has been locked up, and next thing to useless. What an outlet will the Strasbourg and Manheim Railway furnish! Paris may be as well and as cheaply supplied with coal as London.

Belgium—a kind of little England—has for a number of years been well provided with railways; and you may go by locomotion towards its frontiers in all directions, except one—namely, that of Holland. This odd exception, of course, arose from the ill-will that has subsisted for a number of years between the Belgians and Dutch; the latter being not at all pleased with the violent disjunction of the Netherlands. However, that coolness is now passing off. The two neighbours begin to find that ill-nature does not pay, and, like sensible people, are negotiating for a physical union by rail, seeing that a political one is out of the question. In short, a railway is proposed to be laid down in an easterly direction from the Antwerp branch, towards the border of Holland; and by means of steam-boat ferries across the Maas and other mouths of the Rhine, the junction will be effected with the Rotterdam and Amsterdam series of railways. The north of Holland is yet a stranger to railways, nor are the towns of such importance as to lead us to expect any great doings there. But the north German region—from the frontiers of Holland to those of Russia and Poland, a distance of something like 1000 miles—is rapidly filling up the chasms in its railway net-work. Emden and Osnaburg and Gottingen in the west, Danzig and Königsberg and

Memel in the east, are yet unprovided; but almost all the other towns of any note in Prussia and North Germany are now linked together, and most or all of the above six will be so in a few years.

The Scandinavian countries are more interesting in respect to our present subject, on account of *their* railway enterprises being wholly written in the future tense. Denmark has so little continuous land, Sweden has so many lakes, and Norway so many mountains, that, irrespective of other circumstances, railways have not yet reached those countries. They are about to do so, however. Hitherto, Denmark has received almost the whole of its foreign commodities *viâ* the two Hanse towns—Hamburg and Bremen; and has exported its cattle and transmitted its mails by the same routes. The Schleswig-Holstein war has strengthened a wish long felt in Denmark to shake off this dependence; but good railways and good steam-ship ports will be necessary for this purpose. When, in April 1851, a steamer crossed rapidly from Lowestoft to Hjerting, and brought back a cargo of cattle, the Danes felt suddenly independent of the Hamburghers; but the route from Hjerting to Copenhagen is so bad and tiresome, that much must yet be done before a commercial transit can really be established. There was at that time only an open basket-wagon on the route; there has since been established a diligence; but a railway will be the only effective means of transit. Here we must correct a mistake in the last paper: Denmark is not quite without railway accommodation; there is about 15 miles of railway from Copenhagen to Roeskilde, and this is to be continued across

the island of Zealand to Korsör. The Lowestoft project has led to important plans; for a railway has been marked out from Hamburg, through the entire length of Holstein and Schleswig to the north of Jütland, where five hours' steaming will give access to the Swedish coast; while an east and west line from Hjerting to Copenhagen, with two breaks at the Little Belt and the Great Belt, are also planned. If Denmark can by degrees raise the requisite capital, both of these trunk-lines will probably be constructed.

Norway has just commenced its railway enterprises. It seems strange to find the familiar names of Stephenson and Bidder, Peto and Brassey, connected with first-stone layings, and health-drinkings, &c., in remote Norway; but this is one among many proofs of the ubiquity of English capital and enterprise. The government of Norway has conceded the line to an English company, by whom it will be finished in 1854. The railway will be 50 miles in length; it will extend from Christiania to Lake Miösen, and will connect the capital with an extensive chain of internal navigation. The whole risk seems to have been undertaken by the English company; but the benefits will be mutual for both companies—direct steam-communication from Christiania to some English port being one feature in the comprehensive scheme.

In Russia, the enterprises are so autocratic, and ordinary joint-stock operations are so rare, that our Stock Exchange people know very little about them. The great lines of railway in Russia,

either being constructed or definitely planned, are from Warsaw to Cracow (about 170 miles); Warsaw to St Petersburg (680 miles); Moscow to St Petersburg (400 miles); from a point on the Volga to another point on the Don (105 miles); and from Kief to Odessa, in Southern Russia. The great tie which will bind Russia to the rest of Europe, will be the Warsaw and St Petersburg Railway—a vast work, which nothing but imperial means will accomplish. Whether all these lines will be opened by 1862, it is impossible to predict; Russia has to feel its way towards civilisation. During the progress of the Moscow and St Petersburg Railway, a curious enterprise was determined on. According to the *New York Tribune*, Major Whistler, who had the charge of the construction of the railway, proposed to the emperor that the rolling-stock should be made in Russia, instead of imported, Messrs Harrison, Winans, and Eastwick, engineers of the United States, accepted a contract to effect this. They were to have the use of some machine-works at Alexandroffsky; the labour of 500 serfs belonging to those works at low wages; and the privilege of importing coal, iron, steel, and other necessary articles, duty free. In this way a large supply of locomotives and carriages was manufactured, to the satisfaction of the emperor, and the profit of the contractors. The managers and foremen were all English or American; but the workmen and labourers, from 2000 to 3000 in number, were nearly all serfs, who *bought their time* from their masters for an agreed period, being induced by the wages offered for their services: they were found to be

excellent imitative workmen, perfectly docile and obedient.

Our attention now turns south-westward: we cross Poland and Germany, and come to the Alps. To traverse this mountain barrier will be among the great works of the future, so far as the iron pathway is concerned. In the early part of 1851, the Administration of Public Works in Switzerland drew up a sketch of a complete system of railways for that country. The system includes a line to connect Bâle with the Rhenish railways; another to traverse the Valley of the Aar, so as to connect Lakes Zurich, Constance, and Geneva; a junction of this last-named line with Lucerne, in order to connect it with the Pass of St Gothard; a line from Lake Constance to the Grisons; a branch connecting Berne with the Aar-Valley line; and some small isolated lines in the principal trading valleys. The whole net-work of these railways is about 570 English miles; and the cost estimated at about L.4,000,000 sterling. It scarcely needs remark, that in such a peculiar country as Switzerland, many years must elapse before even an approach to such a railway net-work can be made.

To drive a railway across the Alps themselves will probably be first effected by the Austrians. The railway through the Austrian dominions to the Adriatic at Trieste, although nearly complete, is cut in two by a formidable elevation at the point where the line crosses the eastern spur of the great Alpine system. At present, travellers have to post the distance of seventy miles from Laybach to Trieste, until the engineers have surmounted the barrier which lies in their way. The trial of locomotives

at Sömmering, noticed in the newspapers a few months ago, related to the necessity of having powerful engines to carry the trains up the inclines of this line. Further west, the Alpine projects are hidden in the future. The Bavarian Railway, at present ending at Munich, is intended to be carried southward, traversing the Tyrol, through the Brenner Pass, to Innsprück and Bautzen, following the ordinary route to Trieste, and finally uniting at Verona with the Italian railways. This has not yet been commenced. Westward, again, there is the Würtemberg Railway, which ends at Friedrichshafen on Lake Constance. It is proposed to continue this line from the southern shore of the lake, across the Alps by the Pass of the Splügen, and so join the Italian railways at Como. This, too, is *in nubibus*; the German States and Piedmont are favourable to it; but the engineering difficulties and the expense will be enormous. Other Piedmontese projects have been talked about, for crossing the Alps at different points, and some one among them will probably be realised in the course of years. Meanwhile, Piedmont has a heavy task on hand in constructing the railway from Genoa to Turin, which is being superintended by Mr Stephenson; the Apennines are being crossed by a succession of tunnels, embankments, and viaducts, as stupendous as anything yet executed in Europe.

In Central Italy, a railway convention has been signed, which, if carried out, would be important for that country. It was agreed to in 1851 by the Papal, Austrian, Tuscan, Parmese, and Modenese governments. The object is to construct a net-work

of railways, each state executing and paying for its own. Austria is to do the work as far as Piacenza and Mantua; Tuscany is to finish its lines from Pistoja to Florence and Lucca; the Papal government is to connect Bologna with both the former; and the small states are to carry out their respective portions. The great difficulty will be, to cut through the Apennines, which at present sever Tuscany from the other states; but a greater still will be the moral one, arising from the disordered state of Italy. Rome has conceded to an Anglo-French company the construction of a railway from the capital to Ancona; but that, like all other commercial enterprises in the Papal dominions, is lagging sadly.

Crossing the Pyrenees to view the works in the Peninsula, which *Bradshaw* may possibly have to register in 1862, we find that, amid the financial difficulties of Spain, three lines of railway have been marked out—from Madrid to Irun; from Aranjuez to Almansa; and from Alar to Santander. The first would be a great line to the vicinity of the French frontier, to cost 600 millions of reals; the second would be part of an intended route from Aranjuez, near Madrid, to the Mediterranean; the length to Almansa, involving an outlay of 220 millions. The third line, from Santander to Alar del Rey, on the Biscayan seaboard of Spain, is intended to facilitate approach from the interior to the rising port of Santander; the outlay is put down at 120 millions. It is difficult to translate these high-sounding sums into English equivalents, for there are three kinds of reals in Spain, varying from 2-5/8d. to 5-1/4d. English; but taking even

the lowest equivalent, the sum-total amounts to a capital which Spain will have some difficulty in raising. The Santander line, however, has attracted English capital and engineering towards it; the first sod was turned by the king-consort in May 1852, and the works are now in progress. There is also an important line from Madrid to the Portuguese frontier near Badajoz, marked out on paper; but the fruition of this as well as other schemes will mainly depend on the readiness with which English capital can be obtained. Unfortunately, 'Spanish bonds' are not in the best favour in England.

Portugal is a *terra incognita* to railways. It is on the extremest verge of Europe towards the Atlantic; and European civilisation finds entrance there with remarkable slowness. In 1845, the government tried to invite offers from capitalists to construct railways; in 1849, the invitations were renewed; but the moneyed men were coy, and would not be wooed. In 1851, the government appointed a commission to investigate the whole subject. The commission consisted of five persons; and their Report, dated October 20, 1851, contains a large mass of valuable information. It appeared in an English translation in some of the London journals towards the close of the year. The commissioners take for granted that Spain will construct railways from Madrid to the Portuguese frontier at Badajoz on the one side, and to the French frontier, near Bayonne, on the other; and they then inquire how best to reach Badajoz from Lisbon. Three routes present themselves—one to Santarem, and across the Tagus to Badajoz;

another to Santarem and Coimbra, and so on into Spain by way of Almeida; and a third to Oporto, and thence by Bragança into Spain. The first of these, being more directly in the route to Madrid, is preferred by the commissioners, who estimate the outlay at a million and a quarter sterling. They discuss the terms on which capitalists might possibly be induced to come to their aid; and they indulge in a hope that, ten years hence, Lisbon may be united to Central Europe by a railway, of which 260 kilomètres will cross Portugal to Badajoz, 370 from Badajoz to Madrid, and about 400 from Madrid to the French frontier, where the Paris and Bayonne Railway will continue the route. (Five kilomètres are equal to rather more than three English miles.) The Continental *Bradshaw* will, we apprehend, have to wait long before these peninsular trunk-lines find a place in its pages.

Leaving altogether the countries of Europe, and crossing the Mediterranean, we find that even Africa is becoming a member of the great railway system. After a world of trouble, financial and diplomatic, the present ruler of Egypt has succeeded in giving reality to a scheme for a railway from Alexandria to the Nile. A glance at a map of Egypt will shew us that a canal extends from Alexandria to the Nile, to escape the sanded-up mouths of that famous river. It is mainly to expedite the overland route, so far as concerns the transit along this canal, that the railway now in process of construction has been planned; anything beyond this, it will be for future ages to develop. The subject of the

Isthmus of Suez and its transit has been frequently treated in this *Journal*, and we will therefore say nothing more here, than that our friend *Bradshaw* will, in all probability, have something to tell us concerning the land of Egypt before any long time has elapsed.

Asia will have a spider-line of railway by and by, when the slow-coach proceedings of the East India Company have given something like form to the Bombay and Bengal projects; but at present the progress is miserably slow; and *Bradshaw* need not lay aside a page for the rich Orient for many years to come.

There are a few general considerations respecting the present aspect of the railway system, interesting not only in themselves, but as giving a foretaste of what is to come. In the autumn of last year, a careful statistician calculated that the railways of Europe and America, as then in operation, extended in the aggregate to 25,350 miles, the total cost of which was four hundred and fifty millions of pounds. Of this, the United Kingdom had 7000 miles, costing L.250,000,000. According to the view here given, the 7000 miles of our own railways have been constructed at an expense prodigiously greater than the remaining 18,350 miles in other parts of the world. It needs no figures to prove that this is the fact. Many of the continental and American railways are single lines, and so far they have been got up at a comparatively small cost. But the substantial difference of expense lies in our plan of leaving railway undertakings to private parties—rival speculators and jobbers, whose aim has too frequently

been plunder. And how enormous has been that plunder let enriched engineers and lawyers—let impoverished victims—declare. Shame on the British legislature, to have tolerated and legalised the railway villainies of the last ten years; in comparison with which the enforcements of continental despotisms are angelic innocence!

Besides being got up in a simple and satisfactory manner, under government decrees and state responsibility, the continental railways are evidently more under control than those of the United Kingdom. The speed of trains is regulated to a moderate and safe degree; on all hands there seems to be a superior class of officials in charge; and as the lines have been made at a small cost, the fares paid by travellers are for the most part very much lower than in this country. Government interference abroad is, therefore, not altogether a wrong. Annoying as it may sometimes be, and bad as it avowedly is in principle, there is in it the spirit of protection against private oppression. And perhaps the English may by and by discover that jobbing-companies, with stupendous capital and a monopoly of conveyance, are capable of doing as tyrannical things as any continental autocrat!

If a section of the English public stands disgraced in the eyes of Europe by its vicious speculation—properly speaking, gambling—in railway finance, our country is in some degree redeemed from obloquy by the grandeur of a social melioration which jobbing has not been able to obstruct. The wide spread

of railways over the continent, we have said, is working a perceptible change in almost all those arrangements which bear on the daily comforts of life. No engine of a merely physical kind has ever wrought so powerfully to secure lasting international peace as the steam-engine. The locomotive is every hour breaking down barriers of separation between races of men. And as wars in future could be conducted only by cutting short the journeys by railway, arresting trains, and ruining great commercial undertakings, we may expect that nations will pause before rushing into them. Already, the French railways, which push across the frontier into the German countries, are visibly relaxing the custom-house and passport systems. Stopping a whole train at an imaginary boundary to examine fifteen hundred passports, is beyond even the French capacity for official minutiæ. A hurried glance, or no glance at all—a sham inspection at the best—is all that the gentlemen with moustaches and cocked-hats can manage. The very attempt to look at bushels of passports is becoming an absurdity. And what has to be done in the twinkling of an eye, will, we have no doubt, soon not be done at all. Thanks to railways for this vast privilege of free locomotion!

A NEW PRINCIPLE IN NATURE

It is pretty well known that researches by Matteucci, Du Bois-Reymond, and others, have made us acquainted with the influence of electricity and galvanism on the muscular system of animals, and that important physiological effects have been attributed to this influence, more than perhaps we are warranted in assuming in the present state of our knowledge. That an influence is exerted in some way, is clear from the difference in our feelings in dry and wet weather: it has been supposed, however, that the effects on the nervous system are not produced by an accumulation of positive or of negative electricity, but by the combination of the two producing dynamic electricity. While these points are undergoing discussion, we have an opportunity of bringing before our readers the results of investigations bearing on the general question.

Most persons are aware of the fact, that a peculiar taste follows the application of two different metals to the tongue in a popular galvanic experiment. This taste is caused by the azotic acid formed from the oxygen and azote of the atmosphere. An electric discharge, too, is accompanied by a smell, which smell is due to the presence of what is called ozone; and not long ago M. Schoenbein, of Basel, the inventor of guncotton, discovered ozone as a principle in the oxygen of the atmosphere; and it is considered to be the *active* principle of that universal constituent.

Later researches have brought out a striking analogy between the properties of ozone and chlorine, and have led to conclusions as to the dangerous effect which the former may produce, in certain cases, on the organs of respiration. Some idea of its energy may be formed from the fact, that mice perish speedily in air which contains one six-thousandth of ozone. It is always present in the atmosphere in a greater or lesser degree, in direct relation with the amount of atmospheric electricity, and appears to obey the same laws in its variations, finding its maximum in winter and its minimum in summer.

Ozone, in scientific language, is described as 'a compound of oxygen analogous to the peroxide of hydrogen, or, that it is oxygen in an allotropic state—that is, with the capability of immediate and ready action impressed upon it.' Besides being produced by electrical discharges in the atmosphere, it can be obtained artificially by the passing of what is called the electrical brush into the air from a moist wooden point, or by electrolyzed water or phosphorus. The process, when the latter substance is employed, is to put a small piece, clean scraped, about half an inch long, into a large bottle which contains just so much of water as to half cover the phosphorus, and then closing the mouth slightly, to guard against combustion, to leave it standing for a time in a temperature of about 60 degrees. Ozone soon begins to be formed, as shewn by the rising of a light column of smoke from the phosphorus, which, at the same time, becomes luminous. In five or six hours, the quantity will be abundant,

when the bottle is to be emptied of its contents, washed out, and closed for use and experiment.

Whichever way the ozone be produced, it is always identical in its properties; and these are described as numerous and remarkable. Its odour is peculiar, resembling that of chlorine, and, when diluted, cannot be distinguished from what is called the electric smell. When largely diffused in atmospheric air, it causes unpleasant sensations, makes respiration difficult, and, by acting powerfully on the mucous membranes, produces catarrhal effects; and as such air will kill small animals, it shews that pure ozone must be highly injurious to the animal economy. It is insoluble in water, is powerfully electromotive, and is most strikingly energetic in numerous chemical agencies, its action on nearly all metallic bodies being to carry them at once to the state of peroxide, or to their highest point of oxidation; it changes sulphurets into sulphates, instantaneously destroys several gaseous compounds, and bleaches indigo, thus shewing its analogy with chlorine.

In proceeding to the account of his experiments, M. Schoenbein shews, that gases can be produced by chemical means, which exercise an oxidizing influence of a powerful nature, especially in their physiological effects, even when diffused through the atmosphere in very minute quantities: also, that owing to the immense number of organic beings on the earth, their daily death and decomposition, an enormous amount of gases is produced similar to those which can be obtained

by artificial means; and besides these, a quantity of gaseous or volatile products, 'whose chemical nature,' as the author observes, 'is as yet unknown, but of which we can easily admit that some, at least, diffused through the air, even in very small quantities, and breathed with it, exert a most deplorable action on the animal organism. Hence it follows, that the decomposition of organic matters ought to be considered as one of the principal causes of the corruption of the air by miasmatic substances. Now, a continuous cause, and acting on so vast a scale, would necessarily diffuse through the atmosphere a considerable mass of miasmatic gases, and accumulate them till at length it would be completely poisoned, and rendered incapable of supporting animal life, if nature had not found the means of destroying these noxious matters in proportion as they are produced.'

The question then arises: What are the means employed for this object? M. Schoenbein believes that he has found it in the action of ozone, which is continually formed by the electricity of the atmosphere, and is known to be a most powerful agent of oxidation, causing serious modifications of organic bodies, and, consequently, of their physiological action. 'To assure myself,' he pursues, 'that ozone destroys the miasma arising from the decomposition of animal matters, I introduced into a balloon containing about 130 pints of air, a piece of flesh weighing four ounces, taken from a human corpse, and in a very advanced state of putrefaction. I withdrew it after a minute; the air in the balloon had acquired a strong and very repulsive odour, shewing that it

was charged with an appreciable quantity—at least for the smell —of miasm caused by the putrefaction.

Конец ознакомительного фрагмента.