

On the other hand, when demand for tonnage is good and freights are high, it costs me both time and money to meet the demand by building a new ship. My elasticity in this case is slow and costly" (p. 125).

With reference to long periods, may we not apply to the increase of supply (in the colonies) as well as to the decrease of supply in foreign countries—consequent upon a differential tax on wheat—what Mr. Russell Rea says with reference to increase:—

"There is no article the supply of which can be modified more easily than corn. Botanically, wheat is an annual" ? (p. 116).

Altogether, I would rather take the chance of erring with Professor Pigou; though I dare say that Mr. Russell Rea may be right.

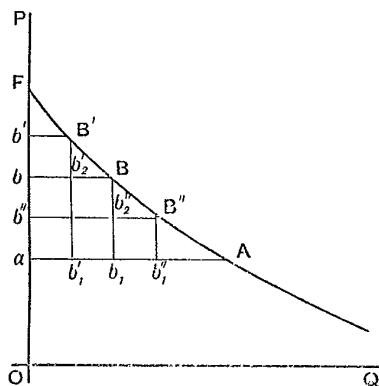
Cours d'Économie Politique professé à l'École Nationale des Ponts et Chaussées. Par C. COLSON. Livre Sixième: Les travaux publics et les transports. (Paris: Alcan. 1907. Pp. 527.)

THE sixth and last volume of M. Colson's Course may properly be made the object of a separate review. It is distinguished from the preceding volumes in that the greater part of their contents has appeared in earlier editions. Besides, it is not only the conclusion, but also the final cause of the whole work: "le but en quelque sort," says the author, "de tout le Cours." It is the crowning height to which the preceding parts lead up by a magnificent gradation. The reader must tread the greater part of this ascent by himself. We can only offer guidance at the first stage. The first volume calls for some notice here so far as it bears upon the volume that is under review.

A reader who, having some previous acquaintance with the economics of transportation but not with M. Colson's earlier volumes, should take up the last one might be surprised at the absence of reference to the literature of the subject. In particular he would desiderate grateful allusion to one of the author's predecessors in office and in studies connected with the *Ponts et Chaussées*, the illustrious Dupuit. This reticence is justified, or at least acknowledged, in the introduction to the whole Course, where the author, referring to the diversity of economic schools, says it has been his object to present the leading common features without entering into the details of quotation and reference. "I have refrained," he says, "almost entirely from bibliographical references, which fill so large a part of modern works; if they

are to be given with sufficient fulness and precision to be used for the purpose of indicating the part played by each earlier writer in the successive elaborations of a doctrine, it would be necessary to devote to references an amount of space which would have entirely exceeded the limits of this work."

Apropos of M. Colson's French predecessors, the English reader may like to be reminded that he employs Supply and Demand curves differing in one slight particular from those which Dr. Marshall has made familiar. The abscissa measured on the horizontal axis (usually designated by $O X$), represents, in the French system, the price, not the amount of commodity which



is offered or demanded at a price. Since the abscissa is by a general convention usually employed to represent the independent variable, the Cournot-Dupuit-Colson system may seem preferable, so far as the amount demanded or supplied depends upon the price. But when, as in the case of Dr. Marshall's "long-period" supply curves, the price (or range of prices during a short period) is considered as changing with the scale of production, there is a certain propriety in regarding the amount of produce as in some sort the independent variable. We have taken the liberty of turning one of M. Colson's diagrams through a right angle, so that the English reader may more readily apprehend the author's reasoning :—

One important argument relates to the case in which a monopolist, instead of charging a single price for a whole class of commodities, charges different prices for different species thereof.

" Let $O b$ be the single price which would bring to its maximum the gain of the monopolist, represented by the area $B b_1 a b$ [$O a$ representing the cost of production of a unit of commodity]. Suppose that while maintaining this price for the purchaser who cannot pay more, the monopolist makes a higher price $O b'$, and manages that it should be paid by those purchasers only who have a demand for the commodity at this price, the amount demanded being $B' b'$. The monopolist's gain is increased by the rise of price paid on this amount of commodity; his gain is then represented by the area $B b_1 a b' B' b'_2$. The Purchaser's Rent [corresponding to Dr. Marshall's Consumer's Surplus] is reduced for all those who pay the price $O b'$ and purchase at this price the quantity $B' b'$ to the curvilinear area $B' b' F$. The surplus for those who could not pay the price $O b'$, and continue to purchase the quantity $B b'_2$ at the old price, $O b$ is represented by the area $B B' b'_2$. The total utility afforded by the monopolised industry after the expenses of production have been paid for, formed by the addition of the monopolist's gain to the purchaser's rent, remains what it was, equal to $B b_1 a F$. If now the monopolist makes a third price $O b''$, lower than $O b$, and manages that it should be paid only by the purchasers of the amount $b_1 b''_1$, which corresponds to the increase of demand due to this lowering of price, it appears that his gain on his increase of sale is represented by the rectangle $B'' b''_1 b''_1 b''_2$. The purchasers who pay the price $O b''$ for the goods which they would still find it for their advantage to buy if they could not obtain them otherwise for prices between $O b$ and $O b''$ benefit by a surplus represented by the area $B'' b''_2 B''$ (Vol. I. p. 223).

There is thus brought out the important fact that a monopolist, by charging two (or more) prices, can benefit at once himself and his customers. This result is obtained by getting rid of the dead loss (*perte sèche*) incident to a single price, represented by the area $B b'_2 B'$ in our figure; a loss to the consumer which is no gain to the monopolist.

This proposition remains true when the monopolist is the State. There is, indeed, a peculiarity in the exercise of monopoly by the State as compared with the "economic man" or company. It is open to the State, by aiming at a point a little below that which affords the maximum of profit, to confer a considerable benefit to its customers with very little loss to itself (Vol. I. p. 220; Vol. VI., *passim*). There is here involved the important principle which has been thus enunciated in the *ECONOMIC JOURNAL*. "A small change of an economic variable quantity at the margin commonly causes a *very small* change in the corre-

sponding surplus." The priority in the application of this principle to Economics seems to belong to Dupuit.¹

Our limited space does not permit us to dilate upon many topics of great interest, such as the elegant illustration of the way in which general expenses—met by tolls (*péages*)—influence the character of competition (Vol. I. p. 230), the analysis of the entrepreneur's functions (pp. 269–273), the use of what some call *a priori* probabilities to show that the continued coincidence of supply- and demand-curves is incredible (Vol. I. p. 308). That sort of probability is (in effect) again employed to estimate, in the absence of precise data, the advantage obtained by consumers from a fall in price (Vol. VI. p. 203).

The principles established in the first volume are applied in the sixth to Public Works. As we understand the definition of this term, the essential attribute is an absence of competition which necessitates the intervention of Government; and the differentia is the economic character of the service admitting of measurement by money. Railways and some other modes of transportation come under this category in that they require the sanction of the State—a "private Bill" at least in England, if not a "concession," as in France. The masses of knowledge, marshalled skilfully under leading principles, which M. Colson brings to bear on this subject, cannot be adequately passed in review. A desultory inspection is all that we can attempt.

I. The principles which govern the price of transportation—fares and freights—are first discussed. If all roads were like the waterways of the ocean, a gift of Nature, the price of transportation would nearly correspond to the prime, or "partial," cost of production. But, in fact, a considerable part of the price consists of tolls, whereby the cost of constructing the roads is compensated. The question is raised, whether the State ought to defray this part of the price. Certainly not, when the service benefits only some particular locality. But so far as the use of a general railway system is common to the community, it is not unreasonable that the community should contribute to its construction. Conversely, it is not unreasonable that tolls paid by the travelling public should be employed to relieve the general taxpayer. Whatever shares of the total utility (Monopoly Revenue + Consumer's Surplus) may be assigned to the travelling public and the taxpayer respectively, the one important condition is that the total utility

¹ See ECONOMIC JOURNAL, Vol. XVIII. p. 400; and compare Dupuit, *De la Mesure de l'utilité des travaux publics*, *Annales des Ponts et Chaussées*, 1844, Vol. II. p. 370.

should be maximised by adapting prices to what each category of the traffic will bear. But M. Colson is well aware that it is often difficult to carry out this precept perfectly; to charge, for instance, a different freight for lime according as it is destined for agriculture or building purposes, if that is a case in which the destination can only be known by the declaration of the customer—the “destinataire.”

II. Statistical fact follows on economic theory; and in the second chapter we are presented with figures and diagrams showing the extent, growth, receipts, expenses, charges of the roads, canals, harbours, railways in the principal countries of the civilised world. The relations between the State and private enterprise in the different countries are exhibited; in particular, the transactions between the State and the railways in France, a complicated subject, which not even French lucidity can render attractive to the general reader.

III. To measure the utility of improvements in transportation is interesting with respect to progress in the past, and useful with respect to projects for the future. The direct and main cause of increased advantage is diminished cost. The statistics adduced in this connection, showing the cost of various kinds of transportation, cannot well be reproduced in a summary. One difficulty is caused by the great discrepancy between extreme and mean prices. For instance, transport across the Channel costs several centimes per ton-kilometre, while the charge for the same unit of transportation in a sailing ship over distances exceeding 20,000 kilometres might be some fraction of a *millime*. Another difficulty illustrates the composition of “toll” and “partial cost” in the charge for transportation by rail. The average charge per train-kilometre in France is 2 francs 34 centimes. “But if we inquire the expense caused by running an additional train, within the limits of elasticity constituted by the organisation of the service, without increase of the *personnel* in the stations, we may estimate it as between 1 and 2 francs,” according to the circumstances. So in the opinion of many experts, the cost of the passenger service is such as to leave the companies very little profit. But this is not to say that the “partial cost” of production for one passenger more is not much less than what he has to pay. Reduction of cost, as we understand, is the cause rather than the measure of advantage. Thus the annual turnover of the railways and tramways of the world may be estimated at 30 milliards (£1,200,000,000); the transportation thus accomplished, if effected by road, would perhaps represent an expense

of 150 milliards. But we cannot measure the benefit procured for the public by the difference between these figures. Over and above the direct benefit, of which Purchaser's Surplus affords the correct measure, there is a stimulus to industry, a succession of beneficial consequences accumulating like a snowball. But this indirect benefit affords no ground for maintaining at the cost of the taxpayer an enterprise which cannot defray its cost of production. Against the encouragement to industrial customers we must now set the discouragement to the industry of the taxpayer, a negative snowball of accumulating detriment. The indirect benefits are commonly exaggerated by the projectors, who clamour for Government assistance—like that one of Molière's *bores*, who, in order to increase indefinitely the King's revenue, proposed : " En fameux ports de mer mettre toutes les côtes."

IV. Under the head of *Systèmes Généraux de Tarifs*, M. Colson considers different kinds of discrimination. In the discussion of this and other topics, he has been largely anticipated by one English and several American writers. But even their readers may have something to learn from our author as to the methods of classification, and the variation of charges according to distance, practised on the European Continent. Competition is another circumstance producing diversity of tariffs. The two species designated by Professor Ripley as competition between routes and commercial rivalry, are classed by M. Colson as " *prix fermes*." He includes in the same category the case in which a railway lowers its freights to encourage consumption.

V. Comparing competition and combination, M. Colson is in accord with all high authorities in ruling out unqualified *laissez-faire*. Discussing competition between railways and other modes of transport, he severely condemns the partiality with which the subvention of the State is employed in France to exempt canals from tolls, to the prejudice of the railway companies and of the public.

VI. If some Governmental interposition in "public works" must be admitted, what form should it take : operation or control ? Our author inclines strongly to the latter alternative. He argues that Governmental management is more expensive, and has less elasticity in the variation of charges according to what the traffic will bear. The political abuses to which State operation would lead in France form the decisive argument against this regime. In the exercise of its control the State may properly insist on new constructions and other improvements being made by railway companies ; provided that the companies are guaranteed

against the risk of the enjoined outlay proving unprofitable. Here, again, we come in sight of the important principle that a small loss to the monopolist may be a great gain to his customer.

VII. The best method of securing co-operation between the controlling and the controlled parties, "le concédant et le concessionnaire," is a financial association. The golden rule for securing coincidence of interest between the financial partners is that the company should not be called on to make an outlay which exceeds its share of the resulting receipts. On this principle, net, rather than gross, receipts should be divided between the parties. The rule is sufficiently well carried out in the arrangement between the State and the larger companies in France. But it is otherwise when, as in the case of the smaller companies, it becomes necessary to substitute for the account of actual expenditure computed or conventional amounts. The formulæ adopted in practice for this purpose are of extreme complexity, presenting, when expressed in mathematical form, a fearful jumble of symbols. Yet, after all, the main conditions for a "formula of exploitation" are not satisfied. M. Colson proposes a simpler and doubtless more effectual formula for the constructive expenses of railway traffic. This "three-term formula" is of the type $a + bR + cT$; where a represents general expense independent of the amount of traffic, R is the actual receipts, b is some proper fraction, T denotes the number of train-kilometres (*le parcours kilométrique des trains*), c a fraction of the mean cost of an additional train-kilometre. For instance, if that additional expense is about sixty centimes, then putting for c *three-quarters* of that mean cost we might have for D the constructive expenditure (in francs) :—

$$D = 800 + \frac{R}{4} + 0.45 T.$$

If the Company increases the train-mileage by an outlay of 60 centimes per kilometre, and the receipts exceed the outlay, the Company will regain more than they have spent—three-quarters of the expenditure in virtue of the third term of the formula, and more than a quarter in virtue of the second term. On the other hand, if the receipts fall short of 60 centimes, the Company will have no interest in making an expenditure which is unprofitable to the community.

VIII. From Transportation our author goes on to the other kinds of Public Works, such as the distribution of water and gas. But we have said enough to excite the interest of the reader. We could not by a continuation of disconnected extracts convey an

adequate impression of the work as a systematic whole. "Disjecti membra poetæ" cannot represent an epic.

Principles of Political Economy. By JOHN STUART MILL. Edited with an Introduction by W. J. ASHLEY. (London: Longmans. 1909. Pp. 1013.)

PROFESSOR ASHLEY is fortunate in the opportunities of his publication. The country has been for many months agitated by a debate relating to the expediency of measures of which the most authoritative, if not quite the earliest, exposition is to be found in Mill's *Political Economy*. The work has been quoted by the Prime Minister in the House of Commons and by an Archbishop in the House of Lords. Most of the arguments in favour of taxing both unearned increment of land value and inherited property, which have resounded on Liberal platforms, are derived more or less consciously, more or less accurately, from Mill's *Political Economy*. The access to this source of influence is facilitated by Professor Ashley. His introduction is, indeed, a leading into the mind of his author. He sketches Mill's mental history in a truly historical spirit, forbearing "to interpose between the reader and the author, and to assign either praise or blame." His treatment is not less objective because he recognises the magnitude of the object: "It is a great treatise, conceived and executed on a lofty plane, and breathing a noble spirit." "Mill," remarks the editor sympathetically, "is a very human personality"; and the remark is illustrated by the variations of feeling shown in changes which Mill introduced in the successive editions of his work. In the laborious work of collating the different editions, Professor Ashley has been assisted by Miss M. A. Ellis's article in the *ECONOMIC JOURNAL* for June 1906. Miss Ellis also contributes a Preface; supplying a want which had long been felt by students. We still desiderate an *apparatus criticus* which might point to and bring into one view passages connected by identity of logic rather than of terminology: for instance, all the passages affected by Mill's difficult doctrine that "demand for commodities is not demand for labour." Professor Ashley does indeed contribute to the interpretation of his author by his Bibliographical Appendix. The succinct notes here appended seem to us to be almost ideally adapted to the purposes of education. The select references will either suffice for the student, or will lead him on to other authorities. It is thus that