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INTEGRATION AND EXCLUSION IN THE TELEPHONE EQUIPMENT INDUSTRY

By JOHN SHEAHAN

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The telephone equipment industry provides a good example of quiet, restrained, public-spirited exercise of large-scale market power. The dominant firm, Western Electric, is linked by common ownership to the Bell System telephone companies, which constitute most of the equipment market. It is not unduly hampered by outside competition in selling to them. Western has in fact a most potent position for an equipment producer: it acts as the buyer for most of the equipment users. It is influenced by regulation affecting the operating companies, but is not itself under regulation. It is limited in business conduct chiefly by executive discretion, not by external market forces or authority.

In January 1949 the Justice Department filed an antitrust suit charging that the telephone equipment industry is largely closed to competition.¹ The *Complaint* requested, among other remedies, a separation of ownership interests between Western and the Bell System operating companies. Events raced on. A settlement ending the suit without trial was reached in January 1956. The head of the Antitrust Division described the settlement as "one of the most important" in antitrust history. The head of AT&T, while describing the terms of settlement as "stringent," noted that it leaves intact

"the unique combination and teamwork of the operating companies, the Bell Telephone Laboratories, and the Western Electric Company that over the years has produced for the people of this country the finest, most widely used and most progressive telephone service in the world."²

1. *United States v. Western Electric Company, Inc., and American Telephone and Telegraph Company*, Civil Action No. 17-49, *Complaint*, 1949. Cited hereafter as *Complaint*. The companies' reply, also issued in 1949, is cited hereafter as *Answer*. The consent decree settling the case, entered January 24, 1956 in the U.S.D.C., New Jersey, is cited hereafter as the *Final Judgment*.

2. *New York Times*, Jan. 25, 1956.

In truth the teamwork is still intact, the industry still recognizable. The purpose of the present paper is to outline the structure of the industry, tentatively assess economic performance in the past, and consider the main respects in which the consent decree is likely to result in change. Concern here is limited to the telephone equipment industry; effects of the settlement and associated suits in reducing patent restrictions in other industries are not considered. This limitation minimizes the apparent effect of the consent decree, and is therefore somewhat unfair to the Antitrust Division. The settlement is not likely to have any substantial impact on the telephone equipment industry itself. But even in this narrower context the decree constitutes an important decision: a choice against competition, in a case where its achievement would have been possible, and an unnecessary step towards an economy controlled by governmental and private administrative discretion.

I. ORGANIZATION OF THE MARKET

A. *Western Electric and the Bell System*

The controlling factor in the telephone equipment market is Western Electric's position as practically exclusive seller to the Bell operating companies, which make up roughly 90 per cent of the private market. Western may usefully be regarded as the manufacturing and supply department in an integrated telephone system meeting most of its own needs. AT&T owns 99.8 per cent of Western's stock and also owns a controlling interest in the Bell System operating telephone companies.

In addition to its basic activity of manufacturing, Western acts as buyer for the operating companies. It buys from outside any non-Western equipment specified by AT&T for Bell System use, buys all the companies' office supplies and miscellaneous materials, runs a nationwide storage and repair system, and salvages junk.

Western's annual sales were \$1,500 million in each of 1953 and 1954. Two-thirds of its 1954 sales were made to Bell companies. About 30 per cent of sales were to the government (mostly military equipment rather than regular telephone items). Sales to domestic non-Bell telephone companies, through Graybar Electric, were less than 5 per cent of the total. Sales to Bell companies in 1954, totalling \$1,019 million, included \$235 million in general supply items not manufactured by Western.³ Western's "telephone equipment" out-

3. Western Electric, *Annual Report, 1954*, pp. 5-6.

put, in the sense of its own production of regular telephone materials, was thus on the order of \$800 million in 1954.

Since Western is embedded in the heart of the Bell System as producer-buyer-distributor, it may be regarded as artificial to separate it out for consideration here as if it were the main firm in a distinct industry. But the separation has meaning because there is a functional difference between producing and using equipment; it is readily possible to define activities and firms constituting an equipment industry and to envisage a market without ownership connections between producers and operating companies — as is the case in most other countries. An additional consideration is that Western's legally separate identity now means that it is not subject to the direct public regulation afflicting the operating companies. Western must do its own regulation.

Regulation of public utilities is a practical nightmare in so far as it is taken seriously, but it should at least be able to prevent rate increases unrelated to cost increases. In the case of the Bell System this power is somewhat vitiated. The regulated companies' costs to some extent depend on Western's policies, which are in turn controlled by the same management interests as those controlling the companies. In this situation rate control by regulatory authorities has little meaning as a device protecting the public, except in so far as it goes beyond operating companies' costs to affect Western's pricing.

State regulatory authorities have long been aware of the possibility of arbitrary pricing by Western, making operating company costs and rates higher than they might be were their equipment purchased in a competitive market. Commission attempts to analyze Western's practices were seriously impeded by the courts prior to 1930, under the established legal position that freely negotiated contracts must be presumed to benefit both parties regardless of intercorporate relationships between them.⁴ This position was reversed by the Supreme Court in the late 1920's, and the new stand was quickly used to open up inquiry on Bell System-Western practices.⁵ In a few cases such inquiries resulted in commission disallowance of rate increases requested on the basis of price increases by Western. This happened several times in the early 1930's, when Western was probably the only large manufacturer in the country raising its prices significantly and repeatedly, a fact which bothered many commissions.

4. E. D. Smith, *A Telephone Rate Case* (Washington, 1941), p. 128.

5. *Smith v. Illinois Bell Telephone Company*, 282 U.S. 133, 152-53 (1930); *Lindheim v. Illinois Bell Telephone Company*, 292 U.S. 151, 156-57 (1934).

Since the early 1930's commission disallowance of rate increases on the ground of unwarranted Western price increases has been rare, and judicial acceptance of disallowances nonexistent. Still, the rather mild needling by state commissions may be a recurrent warning of possibly stronger action, serving to tilt management in the direction of cautious pricing.

The Bell System long ago developed an institutional defense against commission criticism of Western's prices — a legal-economic staff devoted to proving that nobody but nobody undersells Western. Whenever a local rate inquiry refers to Western, AT&T sends out experts to demonstrate that Western's profits are reasonable, and that Bell Company equipment purchases from alternative sources would cost them more. AT&T also circulates such data to the operating companies from time to time, to clarify any confusion as to whether or not the companies' best bet is to let Western handle all their equipment supply. The validity of these showings, which is real if ambiguous, is discussed below. The cost to telephone users of proving Western's virtue is minor, and the need for good material may well have a beneficial effect on Western's pricing policy.

B. Non-Bell Telephone Companies and Equipment Producers

The Bell Companies had the telephone field to themselves from settlement of the basic patent rights in 1879 to expiration of those rights in 1894. The predecessor of AT&T bought control of Western in 1882, and established a manufacturing contract making Western sole supplier to Bell Companies. When the second Bell patent expired in 1894, new telephone companies sprouted like weeds. A classic example of corporate myopia resulted in tight restrictions against sales by Western to the new operating companies, with the inevitable reward that new equipment producers began to sprout like weeds. AT&T made two abortive attempts to purchase control of leading independent producers, in 1902 and 1907, but both tries were blocked by state antitrust laws. In 1908 Western's manufacturing contract was amended to allow the latter to sell to independent operating companies.

The new competition reached a peak about 1910, with 48 per cent of the nation's telephones owned by independent operating companies.⁶ The competition consisted chiefly of grabbing open territory,

6. Federal Communications Commission, *Statistics of the Communications Industry, 1948*.

mostly smaller towns and rural areas in the West. The independent companies were thus doomed to relatively slower growth by the fact that the larger towns served by the Bell Companies grew faster than total population in all regions. By 1940 the independent companies' share of total telephones had dropped to 12 per cent. It has risen slowly since then. AT&T estimates that the independent operating companies owned 9.5 million telephones, 18 per cent of the national total, at the end of 1954. There are "some 4900 independently owned connecting telephone companies. . . ."⁷ Some of them are not very big.

The proportion of the national market for telephone equipment represented by the independent operating companies is much smaller than their 18 per cent share of total telephones. One factor is the Bell System's heavy capital investment in long-distance communications facilities. A second factor is a form of increasing costs: central office equipment per telephone is more costly in larger cities, and thus in the Bell System. Federal Communications Commission statistics counting only companies with over \$50,000 annual operating revenues indicate the non-Bell share of total plant as 5.4 per cent at the end of 1948.⁸ A generous allowance for the uncounted non-Bell companies might bring their total share up to the neighborhood of 10 per cent. This estimate is an approximate ceiling with the principal virtue of being nicely round.

Western Electric is thus exclusive seller to about 90 per cent of the total private market. Even Judge Hand's stringent market share rule appears to be met. But the exact measure of Western's share of the national market is not really very meaningful. Every company in Western's exclusive market is a legal monopoly, and exclusive selling to any one of them constitutes complete monopoly in the area concerned.

On the selling side of the non-Bell market there are six full line equipment producers, plus Graybar Electric acting as a selling outlet for Western. The largest of the producers is Federal Telephone and Radio, a subsidiary of International Telephone and Telegraph. Federal sells to non-Bell companies in the United States, but most of its sales are for export.

Next to Western and Federal is Automatic Electric, a subsidiary of General Telephone. When the FCC made its prewar study of the equipment market, this firm's sales were about 7 per cent of the

7. AT&T, *Annual Report, 1954*, p. 39.

8. FCC, *Statistics of the Communications Industry, 1948*, Table 25.

national total.⁹ Two smaller firms, Leich and North, are now also associated with General Telephone. This group may be considered as a third and not inconsiderable equipment source.

The two other full-line producers are Kellogg Switchboard and Supply and Stromberg-Carlson. The prewar FCC study indicated that Kellogg accounted for about 3½ per cent of total output and Stromberg-Carlson for about 2 per cent. Kellogg was the one company in the industry from which Western would not purchase equipment for Bell System use. Apparently Kellogg had "seen fit to adopt an antagonistic policy."¹ Its antagonism has in any event ceased to be independently exercised: International Telephone and Telegraph purchased control of the company in 1951. Stromberg-Carlson followed tradition and became a subsidiary of a larger company, General Dynamics, in 1955.

The postwar period has thus mildly shaken up the previously quite stable industry. Federal's entry at the end of the war is potentially the most important change, since this company has strong export markets providing the basis for large-scale operations, and has the powerful support of IT&T's finances and research facilities. There are now four independent sources of supply: Western through Graybar, the subsidiaries of General and those of IT&T, and Stromberg-Carlson. Imports are nonexistent, possibly because of the tariff (now 15 per cent, reduced from 30 in 1948), or greater American productive efficiency, or the lack of any substantial market outlet to tempt foreign sellers.

A further possible supply source for telephone equipment, the general electric equipment industry, has been excluded from the telephone field under patent agreements. The agreements (among RCA, General Electric, Westinghouse, AT&T and Western) provided common access to each others' patents but *only* for use on specific sides of carefully defined fences. Western agreed not to make general electrical power or household equipment, and the others to stay out of wire telegraphy, telephony, and some areas of two-way radio communication. The 1926 agreements were amended but basically retained under terms of an antitrust consent decree in 1932, and

9. FCC, *Investigation of the Telephone Industry in the United States* (1936-38), Report No. 1952, Table 14, p. 59. Reports from this investigation are cited hereafter as FCC, Telephone Investigation, *Report* name or number. Company comments on the FCC staff reports are cited as AT&T, Telephone Investigation, *Comment* by company number (all issued 1936-1938).

1. AT&T, Telephone Investigation, *Comment*, No. 17, p. 90.

successfully defended against a move to vacate the consent decree in 1942.²

The 1956 consent decree constitutes a major step towards opening up this patent situation. Bell System patents must now be made available without restriction as to field of use.³ It is the intention of the Antitrust Division to remove systematic patent restrictions in electronics through a group of associated suits.⁴ This is a most important and worthwhile project for its own sake. It may well lead to more effective research in fields outside telephone equipment, and possibly to better equipment alternatives for the independent telephone operating companies. Its significance for the Bell operating companies is likely to remain limited as long as general electrical equipment producers can in practice sell to them only through Western. Unfortunately, this means that the incentive of outside producers to direct effort toward producing new or improved equipment for telephone company use will be as restricted as it has been in the past.

II. PERFORMANCE

A. Western's Prices and Profits

Western Electric's pricing policy is reasonably clear and, in the circumstances, restrained. It aims at a readily defensible rate of return, estimates volume on the basis of operating company market studies, and applies a set of margins intended to yield the chosen rate of profit if volume estimates prove to be correct. Market forces play no significant role: the rate of return is a matter of management choice.

Sometimes Western underestimates volume, and profits threaten to get out of hand. So it cuts prices. This may have to be done in a hurry, with across-the-board percentage cuts. When time permits, the more usual practice is to vary individual prices in line with changing book costs or comparable outside prices. In early 1948 it went through a nice two-stage operation, cutting all prices 5 per cent in January as profits began rising strongly, then coming out in April with a completely revised price structure aiming at the same profit

2. *Complaint*, pp. 44-48; Laurence Wood, *Patents and Antitrust Law* (1944), pp. 128-51; FCC, Telephone Investigation, *Proposed Report*, pp. 258-65; N. R. Danielian, *A.T.&T.* (1939), pp. 132-37.

3. *Final Judgment*, paragraphs X-XVI.

4. Cf. the speech of Assistant Attorney General Barnes before the Antitrust Section of the New York State Bar Association, Jan. 26, 1956 (mimeographed)

rate as in the January reduction. They missed: the rate of return in 1948 was nearly double Western's long-term average, and led to much criticism in subsequent rate cases.

The price policy chosen by Western is not hampered by concern over demand repercussions. Demand elasticity in the relevant price range is infinitesimal. At least Western's officials regard it as zero in computing the revenue effects of proposed price changes, and AT&T's careful market analysts apparently do not consider rates a strategic variable.⁵ Western's executives have little reason to consider demand elasticity high: the range of possible substitution is limited by AT&T's standardization of equipment, and the purchasing companies are usually able to cover increased costs by increased rates. The certainty that indefinitely rising rates would at some point seriously reduce demand is not operationally significant. The relevant elasticity is that of commissions and courts.

Prices are based on full costs, which move inversely to volume in the usual case, and thus inversely to general business cycle movements. So Western's prices come down when business conditions improve, except when raw material prices rise so rapidly as to offset gains from better utilization of capacity, and start moving up when a serious depression sets in. The increases in bad years tend to be viewed unsympathetically by state commissions when the Bell companies respond by requesting rate increases. So Western has been considering revision of its policy, to raise the average rate of profits in good years and accept low profits or losses in bad years. It has also adopted a mild form of countercycle accounting, which overstates current costs in high volume years and understates them in poor years.⁶ These changes, following adverse reactions to policy in the 1930's, have yet to be tested on the depression side. They should ease both Western's public relations and the unhelpful effect of its pricing on general economic stability.

The range of profits considered reasonable by company officials has been recently stated to be 8 to 10½ per cent of net worth. The

5. Cf. the discussion of telephone market analysis in Paul Clark, "An Empirical Study of Investment," unpublished Ph.D. Thesis, Harvard University, 1950, pp. 74-106, and Western Electric price-revenue computations reproduced as Appendix E in FCC, Telephone Investigation, Report No. 2091.

6. Reference here is to the "reserve for equalization of development," introduced in 1939. By 1949 Western had charged \$42 million to this reserve account, roughly equal to 10 per cent of its net income over this period. Accumulations then stopped, but were resumed in 1954.

actual average profit after taxes for 1916–1949 was 8.7 per cent of net worth.⁷ The rate of return has been somewhat higher in recent years: it was 11 per cent in each of 1953, 1954, and 1955. Most utilities would consider this record rather good; most large electrical equipment manufacturers probably would not be enthusiastic.

Western's own standard of reasonableness, used regularly in rate hearings, is the average rate of return for fifty large corporations. AT&T has well expressed the criteria of selection among firms for this comparison: "Obviously the companies compared should be manufacturing concerns, and they should perform the function of supplying an important part of the product of the branch of industry to which they belong."⁸

When Western's returns are compared either to those of other electrical equipment producers, or to what it could earn were the objective a maximum short-run exploitation of its strong position, it seems clear that restraint is being exercised. Perhaps the average return is still higher than need be accepted as necessary. Western's capital is provided by AT&T, and its risk of failure is not distinctly of a different order than that of the Bell System as a whole. Cyclical fluctuations in earnings are more violent for Western than for the operating companies, but this is hardly a reason for a long-run average return significantly in excess of the range considered acceptable for the latter.

Western's dual role as member of the Bell System and competing seller to non-Bell companies might be expected to give rise to some price discrimination between the two markets. It does. Western's equipment sells in the open market (through Graybar) at higher prices than those charged Bell companies. The telephone handset is an extreme but important example of the price differentials. In April 1948 Western's price to Bell companies was \$10.45, while the lowest price in the non-Bell market was \$23.20.⁹ It should be noted that handset prices always play a major role in the telephone rate case demonstrations that the Bell companies gain by buying only from Western. Western's prices *are* lower than those in the open market,

7. National Association of Railroad and Utility Commissioners, *Report on the Operating Results of Western Electric Company, Inc., 1949*, p. 22.

8. AT&T, Telephone Investigation, *Comment*, No. 26, p. 7.

9. Massachusetts Department of Public Utilities, *Investigation by the Department of the Rate Structure of the New England Telephone and Telegraph Company*, D.P.U. 8181 and D.P.U. 8324 (1948–1949), Exhibit 64. Cited hereafter as Massachusetts D.P.U., *Investigation*.

in almost all cases. If Western sold handsets in that market at the same price as in the Bell market, this difference would be removed. So might some of the independent producers.

The higher price level in the non-Bell market is a reflection of Western's decision to restrict sales in that market, plus the fact that the independent producers are generally less efficient. Detailed cost comparisons by the FCC before the war made it fairly clear that Western was then the lowest cost producer for most equipment.¹ The case is clearest for items such as handsets, which are both mass produced and specialized for the telephone industry. Western also has markedly lower costs for the production of lead covered cable, as compared with general wire and cable producers. It does not seem to be invariably the lowest cost producer in cases where: (a) simple components used in telephone equipment have a wide market in other areas, and can be produced by small specialty firms on a highly efficient basis for general markets, or (b) equipment is specialized for the telephone market but involves adaptation to the special conditions of each individual sale. Central office equipment is in the latter category: sales are made in high-value units at a low rate, and the equipment must be adapted to the particular installation. Advantages of scale are not clear for such equipment. Price comparisons are necessarily ambiguous, but Western is not always lowest.²

If any summary of the material on relative efficiency is defensible, it might be suggested that the picture is moderately favorable to Western. Where mass production is possible in this industry, it does seem to result in lower average costs. And Western has a market which permits large-scale production of most equipment. On the other hand, the optimum scale may be well below Western's in many cases, as indicated by its own multiplant production³ and by the

1. FCC, Telephone Investigation, *Report* No. 2105; AT&T, *Comment*, Nos. 27, 28. The numerous conflicts of data and interpretation in these sources are discussed in the author's "Competition Versus Regulation as a Policy Aim for the Telephone Equipment Industry," unpublished Ph.D. Thesis, Harvard University, 1951, chap. 6. Cited hereafter as "Competition Versus Regulation."

2. Company evidence in Massachusetts D.P.U. *Investigation*, Exhibit 64, sec. 8, shows that Western prices were or would have been lowest in 19 of 24 comparable cases examined. Cf. FCC, Telephone Investigation, *Report* No. 292, pp. 131-41, and AT&T, *Comment*, No. 27.

3. This is not to deny the possibility that average costs may be lower with several plants than they would be if each plant were under separate management. But any added savings from common ownership of dispersed plants are surely of a low order of magnitude as compared with the gains from having optimum individual plants in the first place. Cf. Bain, "Economies of Scale, Concentration, and the Condition of Entry," *American Economic Review*, XLIV (March 1954), 15.

ability of smaller firms to match or (rarely) better Western's prices on some equipment. The case for scale as a means of lowering costs does apply, but does not suggest that any change at all in market organization would be bound to raise costs.

Since Western's prices are almost always lower than outside market prices, the Bell Companies are in effect nearly always buying in the cheapest market when they buy from Western. Slight savings might be possible if they were supplied with cheaper outside products in the few cases in which outside prices are more favorable. Savings might become more significant if there were an effective rule requiring Western to turn to outside suppliers in all such cases; a newly created possibility of selling to this gigantic market might lead to more favorable price quotations by outside companies hoping to build a market within the Bell System. As it stands, outside firms can have little reasonable hope of getting much Bell business, and no incentive to try through lower prices to expand their sales in this market.

The markedly higher average level of prices prevailing in the non-Bell market, resting on restricted selling and dual pricing by Western, might quite properly be regarded as a matter for correction in the antitrust settlement. The issue was recognized, but evaded. The Justice Department retained jurisdiction to apply for court orders: "requiring sales, at non-discriminatory prices, of any telephone equipment manufactured by Western or its subsidiaries to independent telephone operating companies, or prohibiting or limiting sales of such equipment to such companies. . . ."⁴ Something might be done sometime, but no one is quite sure what. The company understands the idea to be that they should continue making some sales in the independent market, but keep them down to the traditionally low levels at the traditionally higher prices. If independent operating companies, backed by regulatory authorities, can prove a need for Western's equipment over and beyond a mere interest in saving money, Western may make some direct sales at prices comparable to those for Bell Companies. But if Western were to cut loose and sell freely, competitors would be endangered and the Justice Department might have to intervene.

This aspect of the settlement represents an indefensible fear of competition. If it were corrected to a specific order for open selling by Western at nondiscriminatory prices, two things would happen: telephone equipment would become cheaper for companies providing service to 18 per cent of the country's users, and some of the inde-

4. *Final Judgment*, paragraph XVII (a).

pendent producers might be forced either to go out of business or to shift to general electrical equipment production. It does *not* appear likely from past price comparisons that all of the independents would be driven out of business. Even the smaller ones have been successfully competitive on central office equipment, and it seems most unlikely that Automatic and Federal would be unable to stay afloat at price levels affording Western a 10 per cent return after taxes. If they were not able to survive, they should not. What would be lost would be inefficient production; economies do not lose by such a choice.

B. Western's Cost Accounting

The FCC investigation of Western Electric in 1936-1938 turned up an odd and interesting problem. Western's cost accounting appeared to be very poor — not intentionally misleading, just inaccurate. The problem is particularly significant here because the company's pricing, subject to little market pressure, is largely based on book costs. If recorded costs are not reasonable estimates of actual costs, prices become arbitrary tags which serve no function in relating equipment choices to relative costs.

In common with most large manufacturers, Western uses a standard cost system. This system involves a continuous compromise between frequent revisions of the standards to conform with changing conditions, and operation with inaccurate standards giving weak estimates of actual costs. Standards cannot be revised continuously because the process of accurate revision is itself very costly,⁵ and because the standards serve an important administrative function in facilitating checks on productive efficiency. But they cannot be left unrevised indefinitely: discrepancies between total standard costs and total actual costs are inevitable, and the process of allocating the discrepancies to individual products becomes increasingly untrustworthy as production conditions and relative input prices change. There are better and worse methods of allocating the differentials, but even the best methods leave much to be desired when the discrepancies become very wide, and when changing conditions weaken the likelihood that actual costs among products bear the same relations to each other as they did when the standards were worked out.

Since inaccurate accounting would lead to inefficient production decisions, thus increasing costs, one may assume that management

5. Western estimates the cost of complete revision of its standards to be between one and two million dollars.

will usually weigh carefully the possible loss in profits against the costs of revising standards. In Western's case, however (or in any other where the rate of profit is a matter of management discretion), this assumption is not safe. If accounting were inaccurate, it would not decrease profits, it would only increase the cost of telephone service.

When the FCC investigated Western's accounting in the 1930's, it came to the conclusion that it was a mess. Much of its criticism was unsound, but the problem was real. Western had developed a new set of standards in 1929, premised on steady expansion. The premise proved wrong. From 1930 to 1935, through a sequence of major changes in the scale of operations and cost conditions, the company stuck grimly to pricing based on the standards set in 1929. One example of the effect was provided by the change in estimated complete cost of the hand telephone set on January 1, 1936, when a new set of standards was established: the recorded cost dropped 40 per cent from that previously estimated with the old standards.⁶

Subsequent revisions of standards have been carried out with somewhat less frequency than seems to be the usual practice in competitive industries. As compared with annual or biannual revisions by many other firms,⁷ Western has made its last three complete revisions in 1940, 1948 and 1955. Company officials stress that the number of years between revisions is unimportant in itself, that variations between standards and actual costs are computed for product groups of reasonable homogeneity so major alterations in relative costs are improbable, and that new standards are worked out immediately for products affected by significant process changes. In addition, accounting techniques have improved since the early 1930's, and variations can now be allocated to products more rationally. They are probably correct that Western's accounting is now as accurate as could be desired. This does not seem to have been the case immediately prior to the FCC's comprehensive check in the 1930's.

The recent settlement includes a provision reflecting concern over Western's accounting. Paragraph IX specifies that:

"Western is ordered and directed to maintain cost accounting methods that conform with such accounting principles as may be generally accepted and that afford a valid basis, taking into account the magnitude and complexity of the

6. FCC, Telephone Investigation, *Report* No. 1952 and *Report* No. 2105, p. 29; AT&T, *Comment*, No. 24.

7. Cf. National Association of Cost Accountants, Research Series No. 14, "Standard Manufacturing Costs for Pricing and Budgeting," *N.A.C.A. Bulletin*, XXX (1948), 163.

manufacturing operations involved, for determining the cost to Western of equipment sold to AT&T and Bell Operating Companies for use by them in furnishing common carrier communications services."

The import of this provision is somewhat uncertain. It does not call for any change, nor confer any new authority on the FCC or state commissions to prescribe any change. Its existence probably would strengthen the position of the FCC were it to become convinced of the need for improvement.

The accounting issue is a special aspect of a problem that may become more general if integrated self-regulating firms do become increasingly important in United States industry. Integration makes possible an improvement in the efficiency of resource use. The integrated group can make decisions within its own borders based entirely on relative costs, undistorted by the varying markups prevailing among sellers in an open market.⁸ But this possibility is thrown away when recorded costs are inaccurate estimates of actual relative costs. Where the company limits its own rate of return, it may suffer no loss from inaccuracy, and may overweight the direct cost of careful accounting against the less obvious loss in sacrificed efficiency. If market pressures are not operative, details of management decision on such matters become legitimate issues of public concern.

C. Innovation

Possibly the most important question with respect to the desirability of the present Bell organization is whether or not it has worked out to promote technical advance. In general terms there is no question: technical advance has been highly impressive.⁹ Much of this progress has originated outside the Bell System, but the System has itself contributed greatly to modern improvements in communications. The favorable record of advance may well be considered a sufficient test of acceptability of the present organization. Or again it may not.

The relationship between Western's integration in the Bell System and technical progress may be questioned in two ways. One is the somewhat quarrelsome suggestion that the technical advances have been due chiefly to Bell Laboratories, and the fact that only Western can apply their new ideas to equipment for the Bell Com-

8. Morris Adelman, "Integration and the Outlook for the Future," in *Business Practices Under Federal Antitrust Laws: 1951 Symposium* (Commerce Clearing House), p. 136.

9. Cf. John G. Glover & W. B. Cornell, *Development of American Industries* (3d ed., 1951), chap. 30.

panies adds little to the pace of development. Possibly the close relationships here do speed application of new techniques by permitting producer-research group co-operation without conflict over patent and development rights. A gain may well arise here, although the worth of Bell Laboratories might not be seriously undermined if ownership interests with Western were ended.

A different doubt was raised by the FCC in the 1930's and by the Justice Department in its 1949 *Complaint*: in some instances there may have been unnecessary delay in adoption of improved equipment developed by outside companies. The *Complaint* (pp. 51-62) offers a handy list of arguable examples. The following discussion briefly considers three: introduction of automatic switching, adoption of unattended dial central office equipment for small exchanges, and use of the modern hand telephone set.

Automatic switching was invented by a Kansas City undertaker in the 1890's. He parlayed his technique into the Automatic Electric Company, which began to sell its equipment to non-Bell companies in 1904. An affiliate in England installed the first automatic exchange there in 1912. Both the British Post Office and the Bell System found it unsuitable for their largest exchanges, and the Bell System held off changing to automatic switching while Western worked on an alternative approach. Western solved the large-city problem with its "panel dial" equipment in 1917. But panel equipment proved inferior to Automatic's for all but the largest exchanges. So Automatic equipment was adopted for general use in medium Bell exchanges from 1919. The British Post Office originally decided on panel for London too, but domestic reminders that this would not be buying British led them to hold off until Automatic also solved the large-city problem. London got its first (home produced) automatic switching in 1926. For some time the British choice looked good and the Bell System's poor. Western's equipment proved in practice far more costly than expected, and was not put on an economical operating basis until 1925.¹

The early difficulties with Western's equipment are not surprising for such a major innovation, though perhaps buyers choosing independently would not have continued faithfully adopting panel equipment after the first few costly installations. As concerns the

1. *Complaint*, pp. 56-59; AT&T, Telephone Investigation, *Brief*, pp. 76-77; J. H. Robertson, *The Story of the Telephone* (London, 1947), pp. 99-107 and 156-57; Sir T. F. Purves, "The Post Office and Automatic Telephones," *Journal of the Institution of Electrical Engineers*, Vol. 63 (1925), p. 617.

pace of innovation, Western was first in meeting the problems of very large cities. But adoption of Automatic's equipment for the medium-sized Bell exchanges could probably have started much earlier than 1919; their requirements did not include the improvement which delayed its use in the largest cities. The basic policy seems to have involved waiting for Western to come through, and turning to use of Automatic's equipment only when Western's product became available but proved to be too costly for this particular use.

A second example of possibly delayed innovation is that of unattended dial central office equipment for the very small exchanges. Such equipment was sold to independent companies from 1914; Western began buying it for Bell Companies in 1927. AT&T states that it was impractical at first because it lacked essential protection apparatus. Western Electric research directed at producing satisfactory alternatives was not successful, and from 1927 the equipment was purchased from Automatic and North for the Bell Companies.² The issue hinges on the technical question of whether or not the equipment did need additional protection apparatus for Bell Company use prior to 1927. Possibly so, but apparently the independent operating companies found it useful long before then. It was a problem of informed judgment within the Bell System resulting in delay while Western attempted to come up with a better domestically produced alternative. Can executive judgment function in such a way as to keep consumer interest always foremost in cases complicated by such company interests?

The last example considered here is the change from the original two-part desk telephone sets to the much more convenient modern handset. Handsets were known from the earliest days of the industry, used generally in Europe and produced by some firms here from about 1905, but not adopted by the Bell System until 1927.³

Western experimented with handsets from 1904 to 1907, but found them inefficient. Their use had to be postponed until the problem of interacting noise between receiver and transmitter could be solved.⁴ But apparently the solution was not pushed. Research

2. *Complaint*, pp. 55-56 and 61-62; *Answer*, pp. 33-34 and 38-39; AT&T, Telephone Investigation, *Comment*, No. 37, pp. 37-38.

3. *Complaint*, pp. 53-55; *Answer*, pp. 32-33; FCC, Telephone Investigation, *Proposed Report*, p. 665; AT&T, *Comments*, No. 37, pp. 44-51 and No. 38, pp. 16-18; Floyd R. Simpson, "The Handset Telephone: a Problem in Public Utility Regulation," *Journal of Land and Public Utilities Economics*, Vol. 13, p. 331.

4. Kempster B. Miller, *Telephone Theory and Practice* (New York and London, 1933), II, 45-54; Arthur L. Albert, *Fundamentals of Telephony* (New York & London, 1943), pp. 155-56.

was discontinued until 1910 and was then "somewhat sporadic" until 1917. The *Complaint* points to a management change in 1907, and suggests that the new management was not overly interested in pushing technical advance. The company agrees research on this problem slackened until 1917, but argues that the final solution came from an unexpected direction and would not have been speeded by more intensive applied research.⁵ An independent telephone engineer, writing before the great telephone investigation began, concluded that the original handsets . . . "had certain inherent disadvantages from the standpoint of both operation and maintenance. The American operating companies . . . felt, I think properly, that it would not be wise to accept these sacrifices. . . . There had also possibly been some inertia on the part of American manufacturers and operators about striking at the root of the question and curing the fundamental defects. . . ."⁶

Thus three examples, not devoid of ambiguity. They suggest that sometimes Bell System adoption of technical advances originating outside the System is not as quick as it might be. The last example also suggests that even the Bell System may act as a slow moving bureaucracy at times, whether or not AT&T is correct that in this instance greater research effort would not have paid off any sooner.

The Bell System is basically most active and forward looking in research and development. It does have a bias toward equipment produced by Western, and may delay adopting new equipment from outside firms to give Western a good crack at developing its own alternatives. If the effort is not successful, delays are not infinite: AT&T prescribes and Western does begin buying the outside equipment. Requirements of uniformity in the System play a role here in cutting down the scope for experimentation with new techniques. Bell System policy cuts down on it too.

III. POLICY CHOICES

The telephone industry is definitely workable but it is not competitive. As in all cases of effective integration, the Bell System has the power to exclude rival suppliers to any degree it chooses. The degree chosen here is high.

5. AT&T, Telephone Investigation, *Comment*, No. 37, pp. 46-49. The AT&T management change in 1907 apparently entailed a general policy switch temporarily adverse to research: see W. R. MacLaurin, "The Process of Technological Innovation," *American Economic Review*, XI. (1950), 80, at 97, 110.

6. Miller, *op. cit.*, pp. 45-46.

The decision taken in the settlement of the antitrust suit was to accept the fact of management discretion and inch toward an economy in which the acceptance of private discretion free of market checks leads to attempts to control management choice by government order. We now have the situation as before, plus a few specific orders limiting management choices, and may expect about the same results as before. The choice is defensible. Management's sense of responsibility in this case is genuine. Performance has been, on the whole, good. But the choice was probably not the best open in the situation. A sense of responsibility is not a perfect substitute for the incentives and pressures created by a competitive market. Western's performance has not been such as to preclude the possibility of gain from competition.

The main respects in which Western's past performance has been short of perfection, in order of the preceding discussion rather than in order of importance, are: (1) the practice of increasing prices in depression; (2) price discrimination against non-Bell telephone companies; (3) failure to use in all cases the cheapest source of supply for the Bell Companies — though in practice this has almost been achieved by using Western's equipment, because the latter is almost always the lowest price seller; (4) possibly higher profits than are really warranted, given Western's secure position; (5) inadequate cost accounting lowering the efficiency of resource use within the Bell System; (6) a tendency to delay the adoption of new equipment developed outside the System.

Management policy may well have taken care of the questions of accounting and countercyclical pricing. None of the other issues was settled by the consent decree. The settlement will not change the degree to which state commissions can, through review of proposed rate changes, affect Western's pricing policy. It cannot be expected to speed up the Bell System's reaction to improved outside equipment possibilities. By leaving the ownership interest between AT&T and Western, and leaving equipment specification in AT&T's control, it keeps to a minimum any possibility of significant equipment sales to Bell companies by outside firms. It thereby practically precludes interest on the part of other electrical equipment producers in developing new equipment for the telephone market. The improved incentives that might have been secured from competition will not be promoted.

On the positive side, the settlement may aid technological advance by opening all Bell patents. This could be a major gain for

electronics development generally, and may make it possible for the independent telephone equipment producers to provide improved choices to the non-Bell operating companies. In addition, the decree may facilitate regulation by providing an improved basis for FCC inquiry into Western's accounting. The changes of effective regulation are also improved by a provision restricting Western to the manufacture of telephone equipment.⁷ This means that all Western's operations will lie within areas subject to inquiry in telephone rate cases. The decree thus marks a clear step towards bringing Western itself into a public utility status. The final step may be long delayed, but when it comes it will be relatively painless because it will involve no loss in any function of competition.

The price of moving Western closer to a regulated public utility status is the sacrificed alternative of choosing instead to secure competition within the telephone equipment industry, and to turn Western toward open competition outside the industry. This alternative was a feasible choice.

Two major steps were required to open up competition. First, Western would have had to be separated from the Bell System, so that equipment choices would no longer be systematically biased in its favor. The second major step is the very gain secured in the settlement: removal of patent restrictions keeping electrical equipment producers out of the telephone field. The change would have had real significance if AT&T no longer had any interest in directing equipment choices to Western. This vast market would have become a real possibility to any aggressive electrical equipment firm. Initially, Western would remain in a very strong position to hold all Bell business. But Federal and the smaller producers already provide important sources of supply to an informed buyer actively seeking the best alternative, and effective purchasing tactics by the Bell companies should have made it possible to open the field quite quickly.

Competition would have been possible with the above two steps — the actual patent freedom and the elimination of ownership interests distorting equipment choices. It would not have required, though it would have been aided by, division of Western into two distinct full line producers.⁸ None of these steps would have been impossible had the antitrust suit been carried through to a successful

7. *Final Judgment*, paragraph IV. The settlement stipulates certain minor exceptions to this rule, and allows three years for conformance.

8. Questions of organizational steps to promote competition, and problems of ensuring maintained or improved efficiency in the process, are discussed in detail in "Competition Versus Regulation," *op. cit.*, chaps. 10 and 11.

conclusion. That any court could doubt the absence of competition seems improbable — though admittedly not impossible. What might well worry a court — or might have worried the Justice Department — is a fear that any serious change would weaken efficiency of the telephone system or interfere with defense production by disrupting the existing Bell “teamwork.” It may be useful to consider this problem in assessing the settlement chosen.

Separation of Western from the Bell System would have left intact the operating system, AT&T, and Bell Laboratories. The same research facilities would then support the same management system that now serves to standardize high quality equipment. If Western always had the best equipment to offer, or could produce most cheaply to AT&T specifications, it would still have practically the whole market. But in any case where outside equipment was superior, or could be produced to AT&T specifications more cheaply by a firm other than Western, the choice made would reflect the superior alternative. Once this principle was established, production and research facilities in a good many alert electrical equipment firms would become active supplements to those now in the Bell System.

The difficulty now is not that Western is an inferior choice in the usual case; it is that Western is the best of an artificially restricted range of possibilities. Other firms realize quite correctly that they cannot break into this market on any significant scale, and therefore do not choose to invest money and skill in any actual attempt.

The requirement of standardization is critical for many items of telephone equipment, and would not permit an impersonal market of very large numbers. It does not rule out the possibility of effective competition. Where improvements were developed by Bell Laboratories or by AT&T, the latter would have a maximum interest in making the information available to all producers, and would of course set the standards required of all. Where improvements were developed by producers, it would be necessary for them to sell the ideas to the Bell System. The latter would have no interest in delaying any change for the better, but would be limited in this choice to the producer making the innovation.⁹ The result would be that each producer coming out with a superior innovation would move for the time being, with respect to the particular range of equipment concerned, into exactly the position now occupied by Western. It would be the normal source for that equipment, and prices would depend

9. Unless an open patent pool for all were required or voluntarily established.

on management discretion plus the distribution of bargaining power. The essential difference from the present is that the best choice at any one time would be the best of quite a few alternatives, and any improvement could shift the choice. Bell System equipment could hardly deteriorate, or improve less rapidly, if the range of alternatives were so widened.

The situation envisaged above would involve moving Western back into the electrical equipment industry, and placing the telephone equipment market within the wider electrical equipment market. Producers would shift into, or out of, telephone equipment to the extent that they could successfully compete in that area. This solution would be preferable to perpetuating by an antitrust settlement an artificial market division designed to reduce cross competition.

With respect to defense production, separating Western would leave it with its present productive facilities but deprive it of its present free recourse to Bell Laboratories for further advance and solutions to new problems. Western would, of course, find it necessary to develop its own research facilities, and in the meantime would have to be allowed to continue working with Bell Laboratories on defense problems. This might slow up the establishment of effective competition, but it is hard to see how it would seriously handicap defense production.

Until the Justice Department decided to make the settlement of January 1956, the chances of securing competition in the telephone equipment industry, and improving the industry by such a choice, were quite real. Given the political environment, the patent provisions of the actual settlement and the increased possibility for effective regulation may be regarded as commendable achievements. Given any preference for an economy in which an effective range of buyers' choice acts to limit and control management discretion, a major opportunity has been repudiated. The settlement represents a definite step, in a case where promotion of competition was possible, towards an economy regulated jointly by management discretion and the government.

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