

PUBLIC REGULATION OF THE SECURITIES MARKETS**By****GEORGE J. STIGLER*****Chicago, Ill.**

It is doubtful whether any other type of public regulation of economic activity has been so widely admired as the regulation of the securities markets by the Securities and Exchange Commission. The purpose of this regulation is to increase the portion of truth in the world and to prevent or punish fraud, and who can defend ignorance or fraud? The Commission has led a scandal-free life as federal regulatory bodies go. It has been essentially a "technical" body, and has enjoyed the friendship, or at least avoided the enmity, of both political parties.

The *Report of the Special Study of the Securities Markets of the Securities and Exchange Commission*¹ which was recently released is itself symptomatic of the privileged atmosphere within which the S. E. C. dwells. This study investigated the adequacy of the controls over the security markets now exercised by the S. E. C. The study was well endowed: it was directed by an experienced attorney, Milton H. Cohen; it had a professional staff of more than thirty people; and it operated on a schedule that was leisurely by Washington standards. The study was not an instrument of some self-serving group, nor was it even seriously limited by positions taken by the administration. Such a professional, disinterested appraisal would not even be conceivable for agricultural or merchant marine or petroleum policy, or the other major areas of public regulation. Disinterest, goodwill, and money had all joined to improve the capital markets of America.

The regulation of the securities markets is therefore an appropriately antiseptic area in which to see how public policy is formed. Here we should be able to observe past policy appraised, and new policy defended, on an intellectually respectable level, if ever it is.

We begin with an examination of certain of the *Special Study's* policy proposals. Mr. Cohen presents a vast number of recommendations of changes in institutions and practices. Most are minor, and some are even frivolous (market letters should not predict specific price levels of stocks). The content of the proposals, how-

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1. 88th Congress, 1st sess., House Document 95 (1963) [Government Printing Office, Washington, D. C.] Part I. All citations in text to part, chapter or page refer to this work.

ever, are not our present concern; what is our concern is the manner in which the proposals are reached. More specifically,

1. How does the Cohen Report show that an existing practice or institution is defective?
2. How does the Cohen Report show that the changes it recommends (a) will improve the situation, and (b) are better in some sense than alternative proposals?

In answering these questions I shall use the discussion of the qualifications of brokers and other personnel in the industry (Ch. II), although the numerous other areas would do quite as well.

I. The Formulation of Policy

The Cohen Report tells us that there is cause for dissatisfaction with the personnel of the industry:

From the evidence gathered by the study, it appears that the existing controls have proven to be deficient in some important regards. The dishonest broker-dealer, that "greatest menace to the public," to use the words of one Commission official, continues to appear with *unjustifiable frequency*. Also, the inexperienced broker-dealer *too often* blunders into problems for himself, his customers, and the regulatory agencies.² (Emphasis added)

So there are too many thieves and too many incompetents.

How does Cohen prove that there are enough thieves and incompetents to justify more stringent controls? After all, one can always find some dishonest and untutored men in a group of 100,000: not all the angels in heaven have good posture.

The "proof" of the need for further regulatory measures consists basically and almost exclusively of four case studies. These studies briefly describe four new firms with relatively inexperienced salesmen who were caught in falling markets and in three cases became bankrupt or withdrew from the business. No estimates of losses to customers are made. The studies were handpicked to emphasize the shortcomings of *new* firms, because this is the place where Cohen wishes to impose new controls. The studies are of course worthless as a proof of the need for new policies: nothing Cohen, the S. E. C., or the United States Government can do will make it difficult to find four more cases at any time one looks for them.

Cohen's second, and only other, piece of evidence, is a survey of disciplinary actions against members of the NASD (National Association of Security Dealers) from 1959 through 1961. To quote the report,

²*Ibid.*, p. 51.

The results of this analysis revealed that the association's newest member firms, which are generally controlled by persons having less experience than principals of older firms, were responsible for a heavy preponderance of the offenses drawing the most severe penalties. (Part I. p. 66)

Cohen's summary of the statistical study, of which this sentence is a fair sample, would not meet academic standards of accuracy. The study reveals that of 1014 firms founded before 1941, 223 were involved in disciplinary proceedings between 1959 and 1961; of 1072 firms founded in 1959-60, only 103 were involved in such proceedings. The data are poorly tabulated (dismissals are included, and duplicate charges against one firm are counted as several firms), but however viewed they do not make a case for the need for more regulation, or for more severe screening of new entrants.³ Yet Cohen believes that the basis has been laid for his main finding:

The large number of new investors and new broker-dealer firms and salesmen attracted to the securities industry in recent years have combined to create a problem of major dimension

More than a generation of experience with the Federal securities laws has demonstrated, moreover, that it is impossible to regulate effectively the conduct of those in the securities industry, unless would-be members are adequately screened at the point of entry. (Part I, p. 150)

These alleged findings lead to a series of policy proposals, such as the following:

1. All brokers should be compelled to join "self-regulatory" agencies (such as the NASD).
2. No one who has been convicted of embezzlement, fraud, or theft should be allowed in the industry for 10 years thereafter.
3. A good character should be required of entrants.
4. Examinations should be required of prospective entrants. The report approves strongly of the six month training period now required of customers' men in firms belonging to the New York Stock Exchange.

Cohen believes that the people dealing in securities with the public should have extensive training and screening such as his own profession requires. My lengthy experience with "account executives" of major NYSE firms has not uncovered knowledge beyond what would fit comfortably into a six-hour course. It would have been most useful if Cohen had investigated the experience of customers of

3. The *Report* discusses only the higher rate of use of expulsion as a penalty against younger firms. The *Report* does not relate sanctions to violations so the interpretation of heavier penalties is obscure, even if the more lenient enforcement against older firms remarked upon by the *Report* is waived.

a randomly chosen set of account men with diverse amounts of training and experience: have differences in experience or training had any effect on the profits of their customers? But he never even dreamed of the possibility—or perhaps it was of the need—of pretesting his proposals.

The report takes for granted not only the effectiveness but also, what is truly remarkable, the infallibility of the regulating process:

There is no evidence that these practices are typical . . . but regardless of their frequency they represent problems too important to be ignored. (Part I, p. 268)

The mere fact that there have been any losses at all is sufficient reason to consider whether there are further adjustments that should be made for the protection of investors (Part I, p. 400).

Observe: no matter how infrequent or trivial the damage to investors, the regulatory process must seek to eliminate it (no doubt inexpensively). Surely rhetoric has replaced reason at this point.

As for alternative methods of dealing with the problem of fraud, only one is mentioned:

A number of persons have suggested that a Federal fidelity or surety bond requirement be imposed in addition to or in lieu of a capital requirement. It would seem, however, that such a requirement would present a number of practical difficulties and that more significant protection to the public can be assured through a Federal net capital requirement. No recommendation as to bonding, therefore, will be made at this time (Part I, p. 92).

I must confess to being shocked by this passage. A number of “practical difficulties” exclude the sensible, direct, efficient way to deal with the problem of financial responsibility—difficulties so obvious and conclusive they do not even need to be mentioned.

When one looks at a well-built theatre set from the angle at which the audience is to view it, it appears solid and convincing. When one looks from another direction, it is a set of two-dimensional pieces of cardboard and canvas, which could not possibly create an illusion of validity. So it is with the *Cohen Report*. Once we ask for the evidence for its policy proposals, the immense enterprise becomes a promiscuous collection of conventional beliefs and personal prejudices.

2. A Test of Previous Regulation

A proposal of public policy, everyone should agree, is open to criticism if it omits a showing that the proposal will serve its announced goal. Yet the proposal may be a desirable and opportune one, and the inadequacies of a proposer are no proof of the undesirability of the proposal. And—to leave the terrain of abstract and unctious truth—the past work of the S. E. C. and Cohen’s schemes for its future may

serve fine purposes even though no statistician has measured these probable achievements. Quite so. But then again, perhaps not.

The paramount goal of the regulations in the security markets is to protect the innocent (but avaricious) investor. A partial test of the effects of the S. E. C. on investors' fortunes will help to answer the question of whether testing a policy's effectiveness is an academic scruple or a genuine need. This partial test will serve also to illustrate the kind of study that should have occupied the *Special Study*.

The basic test is simplicity itself: how did investors fare before and after the S. E. C. was given control over the registration of new issues? We take all the new issues of industrial stocks with a value exceeding \$2.5 million in 1923-1928, and exceeding \$5 million in 1949-1955, and measure the values of these issues (compared to their offering price) in five subsequent years. It is obviously improper to credit or blame the S. E. C. for the absolute differences between the periods in investors' fortunes, but if we measure stock prices relative to the market average, we shall have eliminated most of the effects of general market conditions. The price ratios (p_t/p_0) for each time span are divided by the ratio of the market average for the same period. Thus if from 1926 to 1928 a common stock rose from \$20 to \$30, the price ratio is 150 (per cent) or an increase of 50 per cent but relative to the market, which rose by 68.5 per cent over this two year period, the new issue fell 12 per cent.⁴

The prices of common and preferred stocks were first analysed to determine whether they varied with size of issue after one, three, or five years. In each case there was no systematic or statistically significant variation of price with size of issue. The elusiveness of quotations on small issues makes it difficult to answer this question for issues smaller than the minimum size of our samples (\$2.5 million in the 1920's, \$5 million in the 1950's). One small sample was made of 15 issues in 1923 of \$500 thousand to \$1 million for which quotations were available, and this was compared with the 22 larger issues of the same year. The differences were sufficient to leave open the question of the representativeness of our findings for smaller issues.⁵

The annual averages of the quotations (relative to market) are given for common stocks in Table 1.

In both periods it was an unwise man who bought new issues of common stock: he lost about one-fifth of his investment in the

4. The data are more fully described in the appendix.

5. The preferred stocks had almost identical means in the large and small samples, but the small common stock issues had much lower price relative to the first three years, after which they were essentially equal to those of the large issues. But only the first year price relatives differed significantly at the 5 per cent level with the small samples available. There were no systematic differences in the variances of the price relatives of large and small issues.

first year relative to the market, and another fifth in the years that followed. The data reveal no risk aversion.

| Table 1 | | | | | |
|---|------------------|------|------|------|-------|
| NEW STOCK PRICES RELATIVE TO MARKET AVERAGES | | | | | |
| <i>Common Stocks</i> | | | | | |
| | Year After Issue | | | | |
| | 1 | 2 | 3 | 4 | 5 |
| A. PRE-S. E. C. | | | | | |
| 1923 | 92.7 | 85.0 | 77.8 | 62.1 | 67.0 |
| 1924 | 98.0 | 76.3 | 69.1 | 65.9 | 51.0 |
| 1925 | 85.0 | 66.9 | 54.8 | 42.2 | 33.0 |
| 1926 | 90.2 | 81.8 | 77.1 | 62.6 | 66.9 |
| 1927 | 84.7 | 69.1 | 60.1 | 72.6 | 103.4 |
| 1928 | 71.6 | 50.4 | 40.8 | 45.0 | 57.0 |
| Average | 81.9 | 65.1 | 56.2 | 52.8 | 58.5 |
| Standard Deviation.. | 43.7 | 46.7 | 43.7 | 48.5 | 65.1 |
| Number of Issues .. | 84 | 87 | 88 | 85 | 84 |
| B. POST-S. E. C. | | | | | |
| 1949 | 93.3 | 88.1 | 86.7 | 86.9 | 64.9 |
| 1950 | 84.3 | 76.0 | 53.0 | 57.8 | 46.9 |
| 1951 | 83.6 | 78.7 | 76.3 | 80.4 | 74.5 |
| 1952 | 87.7 | 74.3 | 70.7 | 70.4 | 69.8 |
| 1953 | 88.1 | 79.2 | 75.4 | 70.4 | 93.6 |
| 1954 | 53.2 | 48.7 | 56.4 | 48.1 | 42.4 |
| 1955 | 71.8 | 64.9 | 82.3 | 77.8 | 83.4 |
| Average | 81.6 | 73.3 | 72.6 | 71.9 | 69.6 |
| Standard Deviation.. | 23.9 | 27.7 | 31.0 | 30.9 | 38.9 |
| Number of Issues .. | 47 | 47 | 47 | 47 | 47 |

The averages for the two periods reveal no difference in values after one year, and no significant difference after two years, but a significant difference in the third and fourth, but not fifth, years. The ambiguity in this pattern arises chiefly because the issues of 1928 did quite poorly, and the number of issues in this year was relatively large—one-third of all issues of the 1920's were made in 1928. It may well be that these enterprises did not have sufficient time to become well-launched before the beginning of the Great Depression. With an unweighted average of the various years, there would be no significant difference between the averages in the 1920's and the 1950's.

The "proper" period over which to hold a new stock in these comparisons is difficult to specify: presumably it is equal to the average period the purchasers held the new issues. With speculative new issues one would expect the one year period to be much the most relevant, for thereafter the information provided by this year of experience would become an important determinant of the investor's behavior.

These comparisons suggest that the investors in common stocks in the 1950's did little better than in the 1920's, indeed clearly no better if they held the securities only one or two years. This comparison is incomplete in that dividends are omitted from our reckoning, although this is probably a minor omission and may well work in favor of the 1920's.⁶

The variance of the price ratios, however, was much larger in the 1920's than in the later period: in every year the difference between periods was significant at the 1 per cent level, and in four years at the .1 per cent level. This is a most puzzling finding: the simple-minded interpretation is that the S.E.C. has succeeded in eliminating both unusually good and unusually bad new issues! This is difficult to believe as a matter of either intent or accident. A more plausible explanation lies in the fact that many more new companies used the market in the 1920's than in the 1950's—from one viewpoint a major effect of the S.E.C. was to exclude new companies.⁷

The preferred stocks, which were far more numerous than the common stocks in the 1920's pose a special problem. We use the market average as the base for measuring investor experience in order to minimize the influence of other factors, but no such market average exists for preferred stocks. The existing preferred stock in-

6. An estimate of the role of dividends for two years in each period was made as follows: The aggregate dividends received on stocks issues in 1923 and 1924, and in 1950 and 1951, are expressed as rates on return on the initial costs to investors of the issues:

| Year and Type of Issue | Rate of Return on Initial Cost | | | | |
|------------------------|--------------------------------|------|------|------|------|
| | 1924* | 1925 | 1926 | 1927 | 1928 |
| <i>1923-24</i> | | | | | |
| Preferred | 7.11 | 7.10 | 6.77 | 6.50 | 6.30 |
| Common | 7.11 | 6.16 | 6.56 | 6.77 | 7.62 |
| Year and Type of Issue | 1951** | 1952 | 1953 | 1954 | 1955 |
| <i>1950-51</i> | | | | | |
| Preferred | 6.89 | 4.78 | 4.81 | 4.86 | 4.81 |
| Common | 1.62 | 4.17 | 4.11 | 4.08 | 4.26 |

*1923 issues only. **1950 issues only.

This sample suggests that dividends were a larger component of return in the 1920's.

7. Of 26 issues of common stock in 1949-54, only 6 were by companies less than 3 years old; the corresponding figure for 1923-27 was 38 less than three years old of a total of 53 issues.

dexes are actually indexes of the yields of preferred stocks, and exclude defaults or failures, so they do not measure the fortunes of investors in preferred stocks.

The price relatives for preferred stocks are given in Table 2, and it will be observed that the break in the market in 1929 had a decisive influence on the absolute values of these issues. We may in fact summarize the salient numbers:

| Year of Issue | Average Price Relative | |
|---------------|------------------------|------|
| | 1929 | 1930 |
| 1925 | 107.2 | 78.6 |
| 1926 | 94.7 | 85.7 |
| 1927 | 97.8 | 91.7 |
| 1928 | 93.7 | 69.7 |

As a result of this heavy impact, the price relatives are substantially lower after two years in the 1920's than in the 1950's.

| | Year After Issue | | | | |
|-------------------------|------------------|-------|-------|-------|-------|
| | 1 | 2 | 3 | 4 | 5 |
| A. PRE-S. E. C. | | | | | |
| 1923 | 95.3 | 96.9 | 92.0 | 97.6 | 96.2 |
| 1924 | 84.6 | 71.2 | 72.9 | 71.9 | 56.3 |
| 1925 | 107.6 | 108.3 | 118.4 | 107.2 | 78.6 |
| 1926 | 101.1 | 96.2 | 94.7 | 85.7 | 60.5 |
| 1927 | 101.4 | 97.8 | 91.7 | 63.0 | 44.6 |
| 1928 | 93.7 | 69.7 | 50.0 | 29.9 | 31.9 |
| Average | 97.8 | 87.0 | 79.1 | 65.0 | 53.2 |
| Standard Deviation.. | 20.4 | 33.4 | 45.1 | 53.7 | 50.3 |
| Number of Issues .. | 110 | 115 | 117 | 111 | 108 |
| B. Post-S. E. C. | | | | | |
| 1949 | 112.3 | 101.7 | 101.1 | 97.7 | 105.2 |
| 1950 | 99.6 | 96.5 | 97.5 | 103.9 | 105.7 |
| 1951 | 101.1 | 94.3 | 101.8 | 108.8 | 113.1 |
| 1952 | 95.7 | 93.6 | 113.2 | 95.0 | 91.2 |
| 1953 | 148.1 | 117.6 | 119.5 | 104.5 | n. a. |
| 1954 | 112.1 | 102.7 | 88.5 | 77.3 | 88.3 |
| 1955 | 103.6 | 102.0 | 109.2 | 190.5 | 205.7 |
| Average | 107.1 | 99.0 | 102.0 | 107.7 | 114.3 |
| Standard Deviation.. | 18.6 | 13.7 | 20.2 | 51.8 | 66.5 |
| Number of Issues .. | 40 | 38 | 36 | 33 | 29 |

Accordingly we need a deflator, and again use the common stock index (Table 3).

| Table 3 | | | | | |
|---|------------------|------|------|-------|-------|
| NEW STOCK PRICES RELATIVE TO MARKET AVERAGES | | | | | |
| <i>Preferred Stock</i> | | | | | |
| | Year After Issue | | | | |
| | 1 | 2 | 3 | 4 | 5 |
| A. PRE-S. E. C. | | | | | |
| 1923 | 91.2 | 72.9 | 60.0 | 50.9 | 37.2 |
| 1924 | 66.5 | 48.4 | 39.7 | 29.0 | 18.0 |
| 1925 | 93.1 | 75.1 | 60.8 | 43.6 | 41.6 |
| 1926 | 81.0 | 57.1 | 44.5 | 52.4 | 57.7 |
| 1927 | 75.1 | 57.4 | 70.0 | 75.1 | 104.0 |
| 1928 | 74.2 | 71.8 | 80.6 | 94.4 | 70.9 |
| Average | 79.2 | 66.6 | 66.9 | 69.7 | 65.3 |
| Standard Deviation.. | 17.4 | 24.9 | 40.0 | 65.9 | 42.0 |
| Number of Issues .. | 110 | 115 | 117 | 111 | 108 |
| B. Post-S. E. C. | | | | | |
| 1949 | 91.9 | 67.2 | 61.2 | 59.0 | 52.2 |
| 1950 | 80.5 | 71.4 | 62.8 | 63.0 | 45.7 |
| 1951 | 92.5 | 86.1 | 76.3 | 58.2 | 51.5 |
| 1952 | 95.5 | 76.7 | 66.2 | 47.3 | 47.4 |
| 1953 | 121.6 | 68.9 | 59.6 | 54.5 | n.a. |
| 1954 | 79.9 | 62.4 | 56.2 | 47.4 | 43.5 |
| 1955 | 88.2 | 90.8 | 93.8 | 131.4 | 146.8 |
| Average | 91.5 | 76.9 | 69.6 | 62.2 | 59.0 |
| Standard Deviation.. | 15.2 | 14.0 | 13.6 | 37.2 | 49.3 |
| Number of Issues .. | 40 | 38 | 36 | 33 | 29 |

The common stock index seems more appropriate than the unsatisfactory preferred stock indexes, especially since most of the recent preferred issues were convertible.⁸ The average experience, on this basis, was superior in the 1950's for the first two years after an issue was purchased; thereafter there was no difference.

The undeflated preferred stock experience is the same in both periods for the first two years, and the deflated experience is the

8. In the 1920's, 36 of 121 issues were convertible and in the 1950's 28 of 40 issues were convertible.

same in both periods for the last three years; the opposite indexes show a superior performance in the 1950's. This combination of results suggests that our deflators are inappropriate, and we can only repeat our lament at the absence of a relevant preferred stock index.

Since convertibility is much more common in the later issues, there is an argument for comparing the earlier issues to the base year, and the later issues to the common stock index. The average period these new issues are held may also be longer than common stocks are held. These various considerations combine to suggest that the preferred stock performance was not significantly better in the 1950's than in the 1920's.

These studies suggest that the S. E. C. registration requirements had no important effect on the quality of new securities sold to the public. A fuller statistical study—extending to lower sizes of issues and dividend records—should serve to confirm or qualify this conclusion but it is improbable that the qualification will be large, simply because the issues here included account for most of the dollar volume of industrial stocks issued in these periods. Our study is not exhaustive in another sense: we could investigate the changing industrial composition of new issues and other possible sources of differences in the market performance of new issues in the two periods.

But these admissions of the possibility of closer analysis can be made after any empirical study. They do not affect our two main conclusions: (1) it is possible to study the effects of public policies, and not merely to assume that they exist and are beneficial, and (2) grave doubts exist whether if account is taken of costs of regulation,⁹ the S. E. C. has saved the purchasers of new issues one dollar.

3. The Criteria of an Efficient Market

So far as the efficiency and growth of the American economy are concerned, efficient capital markets are even more important than the protection of investors,—in fact efficient capital markets *are* the major protection of investors. The Special Study devotes considerable attention to the mechanism of the most important single market, the New York Stock Exchange.

One can ask whether this market is competitively organized: are the prices of brokers' services set by competitive forces? The answer is clearly in the negative, and the Cohen Report is properly critical

9. The costs of the program, that is to say, probably exceed even a reasonably optimistic estimate of benefits. Costs of flotations due to registration have apparently never been estimated even approximately; the S.E.C. data (e.g., *Cost of Flotations, 1945-49*) exclude costs included in commissions of underwriters and costs of the delays imposed by the process, as well as costs of operating the S.E.C. The full costs of registration for new stock issues could be 5 per cent of their value.

of the structure of commissions of the NYSE, which is highly discriminatory against higher priced stocks and larger transactions. The Report explicitly refrains from discussing the compulsory minimum rates set by this self-regulating cartel. The reason for silence is obscure: the present scheme of compulsory private price fixing of brokers' services seems to me wholly objectionable. The replacement of cartel pricing by competition, with review lodged in the Antitrust Division, would confer larger benefits upon investors than the S. E. C. has yet provided.

The mechanism of response to changing conditions is a more subtle matter, dealt with especially in Chapter VI (Exchange Markets) of the *Special Study*. The task of providing continuity and orderliness of markets in specific stocks is now performed by the specialists, aided or observed (as the case may be) by the floor traders. How well do they presently perform their tasks?

(1) The NYSE uses a "tick test" of the effects of specialists on short run price fluctuations. If a transaction takes place below the last different price, it is called a minus tick, and if above the last different price, it is a plus tick. Purchases on minus ticks and sales on plus ticks are considered stabilizing, and in 3 sample weeks, 83.9 per cent of specialists' transactions were of this type. The *Special Study* rejects this test on two grounds:¹⁰

- (1) A tick by itself does not necessarily represent a change in the public's evaluation of the security. Thus, after a transaction at 35, the specialists will often offer 34½ and ask 35½, and a transaction at either price is a so-called stabilizing tick. This represents only a random sequence of buy and sell orders.
- (2) The specialists' own profit incentive is to buy low and sell high,—and presumably (but the *Special Study* does not say explicitly) no virtue attaches to profitable activity.

The *Special Study* demands that the test be applied to a longer sequence of transactions; on individual pairs of transactions the test "can be expected to reveal only cases of grossly destabilizing activity."¹¹ Specialists engage in only a third of all transactions, but as a rule at least one-third of the ticks in a stock are negative and one-third positive in a day. Hence the specialists could foster market movements while appearing to stabilize them, or so the Report argues. Thus if the specialist sells in the underlined transactions in the following sequence,

35 34½ 34¾ 34 34½ 33¾ 34

10. *Special Study*, Part 2, pp. 102-03.

11. *Ibid*, p. 104.

he is stabilizing by the tick test while riding with a market trend. This prescient behavior is not documented, nor is a specific tick test proposed.

(2) The preferred test of the specialist's effect is how his inventory of stock varies as the market price fluctuates:

That is, a member trading pattern which tends to produce purchase balances on declining stock days and sales balances on rising stock days would indicate that members exert a stabilizing influence on the stock days in which they traded. (Part 2, p. 55)

An analysis is made of changes in specialists' stock inventories on four days. In each case inventories moved with the market,—i.e., they were destabilizing. But if the analysis is performed on stocks classified as rising or falling, balances moved in a stabilizing fashion in seven of the eight cases (Part 2, p. 108). But *within* these eight groups there were a substantial number of cases in which inventories of stocks moved with the market, so specialist performance left something to be desired. Mr. Cohen's standards have not flagged: he expects every specialist to do, not his best, but perfectly.¹²

The economist will have observed that the Report has no theory of markets from which valid criteria can be deduced by which to judge experience. The tick test and the "offsetting balances" tests are both lacking of any logical basis: these tests assume that smoothness of price movement is the sign of an efficient market, and it is not. Let us sketch the problem of an efficient market.

The basic function a market serves is to bring buyers and sellers together. If there were a large number of people who sent their bid and ask prices to a single point (market), we should in effect observe the supply and demand functions of elementary economic theory. The price that cleared this market would be established—it would be a unique price if there were sufficient traders to produce continuity of supply and demand functions—and trading would stop.

This once-for-all, or at most once-per-period, market differs from most real markets in which new potential buyers and sellers are appearing more or less irregularly over time. Existing holders of a stock wish to sell it—at a price—to build a home, marry off a daughter, or buy another security which has (for them) greater promise. Existing holders of cash wish to buy the stock, at a price. Neither group

12. The *Special Study* shows particular concern with the specialist "reaching across" the market, i.e., who initiates transactions by buying stock at the offer or selling at the bid, instead of waiting for someone to trade. This alarm again reflects the Study's identification of the specialist's proper role with strict price stabilization. Suppose the bid is 30 and the ask 30½ and the specialist anticipates that the market will soon go to 32-32½. He buys at 30½ so the effective ask becomes (say) 30¾. He has initiated a price move, but one called for by his function of achieving equilibrium, if his anticipation is correct.

is fully identified until after the event: I would become a bidder for a stock that does not fall within my present investment horizon provided that its price falls for reasons which I believe are mistaken.

So demand and supply are flows, and erratic flows with sequences of bids and asks dependent upon the random circumstances of individual traders. As a first approximation, one would expect the number of holders of a security to be proportional to the total value of the issue. Then the numbers of bids, offers, and transactions would also be proportional to the dollar size of the issue. This is roughly true: the turnover rate of a random sample of 100 stocks in one month is classified by the total value of the issues, in Table 4, and only in very small and very large issues was there a considerable departure from proportionality.¹³

| <u>Value of Issue (Millions of dollars)</u> | <u>Number of Stocks</u> | <u>Rates of Shares Traded to Total Outstanding</u> |
|---|-----------------------------|--|
| Under 5 | 9 | .012 |
| 5—10 | 12 | .026 |
| 10—25 | 18 | .037 |
| 25—50 | 10 | .043 |
| 50—75 | 11 | .073 |
| 75—100 | 12 | .034 |
| 100—250 | 13 | .027 |
| 250—500 | 8 | .029 |
| 500 and over | 7 | .008 |

13. Of course the frequency of transactions depends upon the size of the individual transactions, but this is not closely correlated with frequency. A short sequence of the transactions of the NYSE was tabulated for November 5, 1963:

| <u>Number of Transactions</u> | <u>Number of Stock Issues</u> | <u>Average Transaction Size (shares)</u> |
|-----------------------------------|-----------------------------------|--|
| 1 | 264 | 225 |
| 2 | 97 | 181 |
| 3 | 51 | 199 |
| 4 | 30 | 190 |
| 5 | 13 | 192 |
| 6 | 12 | 303 |
| 7 | 3 | 200 |
| 8 | 3 | 196 |
| 9 | 3 | 144 |
| 12-16 | 9 | 172 |
| 18-67 | 3 | 236 |

Table 5

DEMAND SCHEDULE FOR A SECURITY

| <u>Price</u> | | <u>Aggregate Demand</u> |
|------------------|-----|-------------------------|
| 28 $\frac{3}{4}$ | (0) | 800,000 |
| 29 | (1) | 780,000 |
| 29 $\frac{1}{4}$ | (2) | 760,000 |
| 29 $\frac{1}{2}$ | (3) | 740,000 |
| 29 $\frac{3}{4}$ | (4) | 720,000 |
| 30 | (5) | 700,000 |
| 30 $\frac{1}{4}$ | (6) | 680,000 |
| 30 $\frac{1}{2}$ | (7) | 660,000 |
| 30 $\frac{3}{4}$ | (8) | 640,000 |
| 31 | (9) | 620,000 |

Let us take a very primitive model of a random sequence of bids and asks, and see what this sequence implies for (1) the level of transaction prices, and (2) the time until a bid or ask is met and a transaction occurs. We start with a demand schedule (Table 5) for a given stock of which 710,000 shares are outstanding, and the equilibrium price is between 29 $\frac{3}{4}$ and 30. A sequence of bids and asks now appear. They are truly random: two-digit numbers from a table of random numbers are drawn, and the first digit determines whether it is a bid or ask (even or odd, respectively) and the second digit determines the level of the bid or ask (0 to 9, or, in market price units, 28 $\frac{3}{4}$ to 31.) (This uniform distribution is replaced by a normal distribution later, but it suffices for the present.) The sequence of random numbers (here called "tenders") proceeds:

- (1) 28 : a bid (2 is even) of 8 (=30 $\frac{3}{4}$)
- (2) 30 : an ask (3 is odd) of 0 (=29 $\frac{3}{4}$)

Here a transaction occurs at 30 $\frac{3}{4}$ because this highest outstanding bid exceeds the seller's minimum ask. To proceed:

- (3) 95 : an ask of 5
- (4) 01 : a bid of 1
- (5) 10 : an ask of 0

This last trader sells at 1(=29) to the fourth tender. The process continues, with the further rule that any unfulfilled bids or asks are cancelled after 25 numbers. The transaction price and the minimum

unfulfilled asking price and maximum unfulfilled bid are shown in Figure 1.

The transaction prices fluctuate substantially, as will be seen,—indeed the mean absolute deviation from the equilibrium price (taken as the closer of $29\frac{3}{4}$ or 30) is \$0.34, or 34 per cent of the maximum possible absolute deviation. The average delay in fulfilling a bid or ask is 3.8 units of tenders.¹⁴ These particular results depend upon the special distribution of bids and asks we assume, but any reasonable distribution will generate significant fluctuations in price and significant and erratic delays in filing bids or asks.

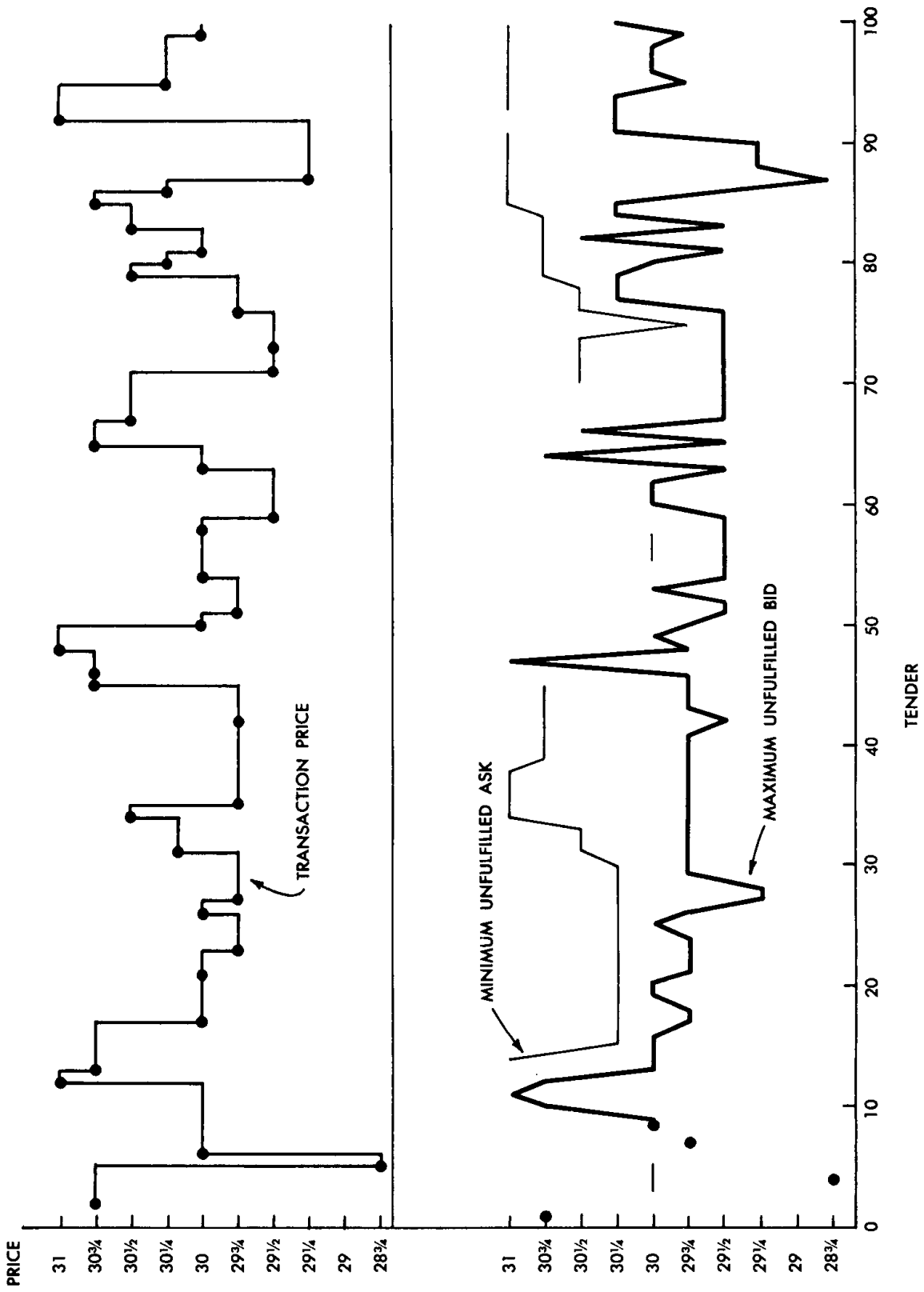
The time unit involved in the foregoing analysis is the interval between successive bids or asks. If tenders are proportional to transactions, and the latter to dollar size of issue, this time unit will be inversely proportional to the size of issue. The time unit will be roughly 1/1,000 as long for American Telephone and Telegraph as for Oklahoma Gas and Electric common. In addition the effective price unit for trading may be $\frac{1}{4}$ or $\frac{1}{2}$ dollar for the less active stock where it is $\frac{1}{8}$ for the active stock.

In addition to allowing buyers and sellers to deal with one another, an efficient market is commonly expected to display the property of resilience (to use an unfamiliar word for a property whose absence is called "thinness"). Resilience is the ability to absorb *market* bid or ask orders (i.e., without a price limit) without an appreciable fluctuation in price. No market can absorb vast orders without large price changes, so this condition must be interpreted as follows: market buy and sell orders of a magnitude consistent with random fluctuation in tenders with an unchanging equilibrium price should not change the transaction prices appreciably.

The reason for making resilience a property of efficient markets may be approached through an analogy. If in a geographical area prices of a product differ, in response to random demand changes, by more than transportation costs, we say that the allocation of the product will be inefficient: *A* will buy the good for \$6 when *B* is unable to obtain it for \$7 (including transportation costs). Alternatively, the owners of the good are not maximizing its value.

Similarly, if random fluctuations in price—under our assumed condition of a stable equilibrium price—lead to price changes greater than inventory carrying costs (the cost of transporting a security from one date to another), the allocation of the product will be inefficient among buyers. Alternatively, the sellers are not maximizing the value of their holdings.

14. This delay is the average of 7.59 units for the earlier tender plus zero units for the tender that makes a transaction. If we include bids or asks cancelled after 25 time units, the average delay is 8.04 units—perhaps a half hour for an active stock, a week or month for an inactive stock.



If access to the market is free, speculators will appear to provide resilience by carrying inventories of the stock; they are in fact primarily the specialists of the NYSE plus the floor traders. The speculators will charge the cost of carrying inventories and of their personal services by the bid-ask spread they establish, and in competitive equilibrium this spread will be just remunerative of these trading costs. The technical efficiency with which this inventory management is conducted will be measured by the spread between bid and ask prices.

In addition there are costs of the provision of the machinery of exchange, and these are also part of the cost of transactions. The performance of the main function of the exchange as a market place is subject to economies of scale. The greater the number of transactions in a security concentrated in one exchange, the smaller the discontinuities in trading and the smaller the necessary inventories of securities. As a result the price of a security will almost invariably be "made" in one exchange.

Specialists would then alter the price pattern of Figure 1 by setting fixed bid and ask prices (under the present assumption of fixed supply and demand conditions). They will offer to buy all shares at say $29\frac{3}{4}$ and sell to all buyers at 30, and the difference (the "jobber's turn") will be the compensation for the costs of acting as a specialist.¹⁵

To summarize: the efficient market under stationary conditions of supply and demand has the properties:

1. If a bid equals or exceeds the lowest asking price (and similarly for offers), a transaction takes place.
2. Higher bids are fulfilled before lower bids, and conversely for offers.
3. Prices will fluctuate only within the limits of speculator's costs of providing a market (under competition).

In this regime the cost of transactions (half the bid-ask spread plus commissions) will be the complete inverse measure of the efficiency of the markets. Bid and ask prices will be (almost) constant through time.¹⁶

15. Specialists affect our model in the following ways:

- (1) the bid of $29\frac{3}{4}$ effectively eliminates all offers by non-dealers at less than $29\frac{3}{4}$, so frequency distribution of offers now ranges from $29\frac{3}{4}$ to 31, with the lowest offer arising 5/10 of the time on average.
- (2) The offer of 20 effectively eliminates all bids by non-dealers at more than 30, with similar consequences.

16. In the absence of specialists, the gains or losses of buyers measured from an expected price of $29\frac{7}{8}$ was exactly offset by the corresponding losses or gains for sellers. (We ignore commissions, which will be the same with or without specialists, at least as a first approximation.) The parties now

Let us consider now the formidable task of real markets, in which the equilibrium price changes without precise or advance notice. We illustrate the characteristic price patterns in the absence of speculation with Figures 2 and 3.

The sequence of bids, asks, and transaction prices follow the procedure of Figure 1 with four changes:

- (1) The random numbers are normally distributed (with $0 = \$1$).
- (2) In Figure 2 the equilibrium price is dropped from \$25 to \$23.75 after 50 tenders.
- (3) In Figure 3 the equilibrium price begins a linear upward trend of 5 cents per tender after 25 tenders.
- (4) No tenders are cancelled because of staleness.

In each case, after the equilibrium changes the unfulfilled tenders are alternatively (1) retained, and (2) changed by the amount of the change in the equilibrium price—the two alternatives bracket the most reasonable assumptions. If the reader will compare the equilibrium prices with the observed sequences he will better appreciate the task of the specialist in detecting true changes and avoiding false changes in the equilibrium price (=population value).

(Figures 2 and 3 follow)

lose the jobber's "turn" of (say) $\frac{1}{4}$, which is the price they pay for one of two things.

- (1) Immediate availability of a buyer or seller.
- (2) The elimination of short run fluctuations in price.

These two gains are analytically one: there is always an available buyer at a low enough price, and an available seller at a high enough price, so the gain of immediate marketability is at a price which contains no random elements. (Strictly speaking, we should say a price with much reduced random elements. The specialists' inventory will be exhausted from time to time when unusually long runs of bids or asks arise, since inventories will not be held in quantities sufficient to cope with the longest runs.)

With perfect foresight, the analysis would be modified in only one respect: the equilibrium price of a security could never fluctuate by more than the cost of holding it.

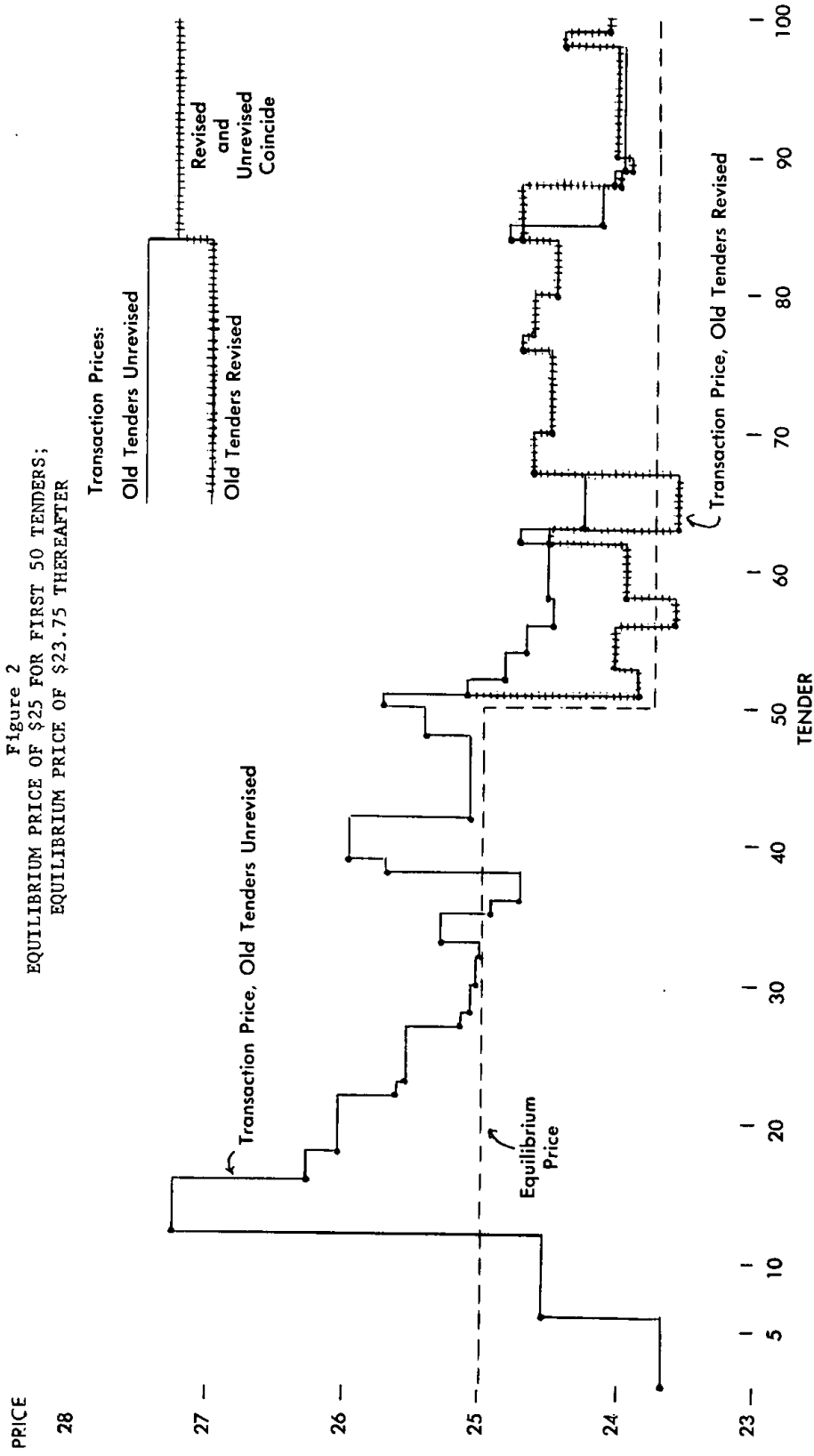
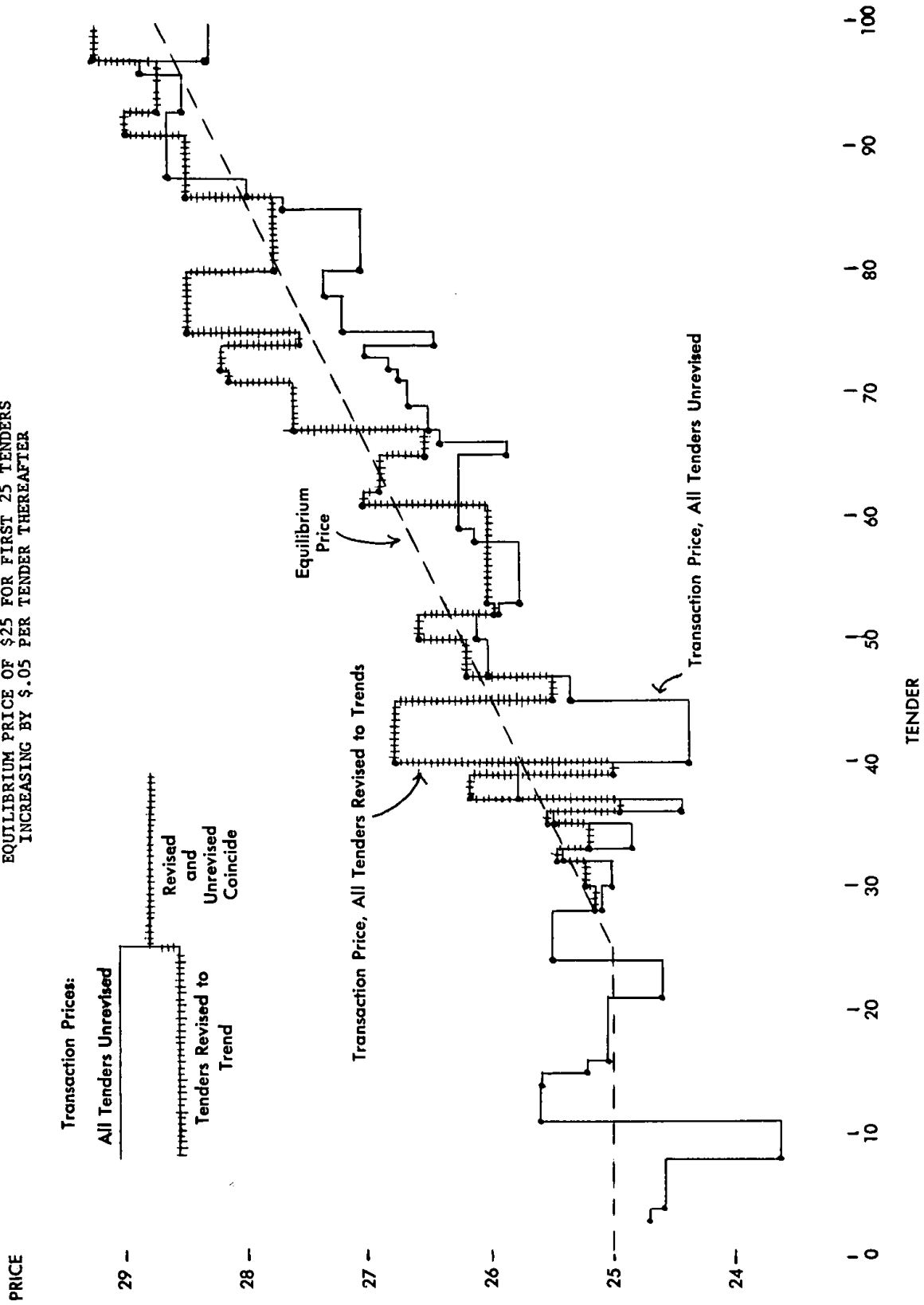


Figure 3
EQUILIBRIUM PRICE OF \$25 FOR FIRST 25 TENDERS
INCREASING BY \$.05 PER TENDER THEREAFTER



If the impacts on equilibrium are sudden and unexpected—as in the examples underlying Figure 2—the appropriate market response is an immediate and complete shift to the new price level. Under this condition the demand for “continuity” in a market is a demand for delay in responding to the change in demand conditions, and the Special Study to the contrary, there simply is no merit in such delay.

The popular NYSE practice of suspending trading until buy and sell orders can be matched at a “reasonable” price is open to serious objection. To prevent a trade is no function of the exchange, and any defense must lie in a desire to avoid “unnecessary” price fluctuations. An unnecessary price fluctuation is surely one not called for by the conditions of supply and demand of the *week* even though the fluctuation may reflect supply and demand of the *hour*. This suspension of trading means that the exchange officials know the correct price change when there is a flood of buy or sell orders. We need not pause to inquire where they get this clairvoyance; it is enough to notice that the correct way to iron out the unnecessary wrinkles in the price chart is to speculate: to buy or sell against the unnecessary movement. The omniscient officials should be deprived of the power to suspend trading but given vast sums to speculate. Since omniscience can surely earn 20 or 50 per cent a year on the market, there should be no trouble in raising the capital. To disassociate random from persistent changes is sufficiently difficult, however, to make me very admiring of the courage of those who invest in Omniscience Unlimited.

The wholly unexpected shift in market conditions infrequently occurs—as the assassination of President Kennedy and the heart attack of President Eisenhower illustrate. But almost every event casts a shadow before it: the outbreak of war, the expropriation of foreign subsidiaries, the growth of imports of a product, the glowing income statement—all are more or less predictable as to date and import. The speculators then act within a system in which there is partial anticipation of most events that occur (and many that do not). They will attempt to guess the future course of events, and to the extent that they succeed they will make profits and smooth the path of the price quotations.

In appraising the performance of the market under changing conditions we must abandon our criterion of efficiency in a stationary market that price should be constant over time (p. 28). We now must judge the performance of two functions by the speculator:

1. How efficiently does he perform his function of facilitating transactions by carrying inventories and making bid and ask prices?
2. How efficiently does he predict changes in equilibrium price, or, in other words, how closely does he keep bid and ask prices to the levels which in retrospect were correct?

The first of these functions is analytically the same as that encountered in the stationary market, but it is now more difficult to discharge or appraise. It is much harder to judge the proper inventories and the proper amount of resources to devote to ascertaining the "true" market price than in the stationary market. The criterion of efficiency is still the cost of consummating a transaction. Much current work on inventory theory, queuing, and related subjects should contribute to the power of our tests of the efficiency of speculators.

The second function, the anticipation of price changes, has one measurable attribute: the trading profits of the speculators are a measure of their skill in anticipating price movements. What is more interesting is that the positive profits of the speculators also demonstrate that their activity stabilizes prices in the sense of reducing the variance of prices over time.¹⁷

These profits as reported by the Special Study have been quite attractive: on liquid capital of \$76.3 million in 1960, specialists made a trading income of \$21.2 million (Part 2, pp. 371, 373), as well as making \$19.6 million in commissions. No profitability data are given for floor traders.

4. Conclusion

I have argued at suitable length that the Cohen Report makes poor use of either empirical evidence or economic theory, so its criticisms are founded upon prejudice and its reforms are directed by wishfulness. Full disclosure is the rule of the hour, so I must add that the academic scholars have not given to the capital markets the attention they deserve because of their importance and analytical fascination. The area is replete with problems in the economics of information: what over-the-counter transactions should be required to be reported; should floor traders' orders be delayed in execution to achieve parity with outsiders; etc.? It is an equally attractive area for the theory of decisions under uncertainty: what are the ex post criteria of efficient speculation? The prospects of research are glowing,—should we start censoring this form of literature too?

17. See Lester G. Telser, *A Theory of Speculation Relating Profitability and Stability*, REVIEW OF ECONOMICS AND STATISTICS (August 1959).

APPENDIX

The lists of new flotations of common and preferred stocks are taken from the *Commercial and Financial Chronicle* for the earlier period, and *Investment Dealer's Digest* for the later period. Issues first offered only to stockholders and privately placed issues are excluded, as are public utilities and railroads.

The price quotations are the initial asking price and, at subsequent twelve-month intervals, the averages of the weekly high and low for the week nearest the middle of the month. Averages of monthly highs and lows are employed where weekly quotations are not available. Stock splits and dividends are eliminated, i.e., the price of a share is multiplied by the number of shares the original share has become. If an issue of preferred stock is retired, its retirement value is used in the year of retirement, after which it is dropped from the sample.

The price relatives presented here are relative to issue price.

The market index is *Standard and Poor's Annual Industrial Index*. It is said to be biased upward in the early period but not in the later period; this bias would of course exaggerate the influence of the S.E.C. in our tests. *Standard and Poor's Index* covers only common stocks. Tables 1 and 3 of the text summarize information for these price relatives deflated by the relative value of the market index for the same period.

(Appendix Tables A-1 and A-2 follow)

TABLE A-1

COMMON STOCKS

| | | 1923 | | | | | |
|-------|---|-------------------------------|-----------------|---------|---------|---------|---------|
| Month | Stock Name | Value of Issue (thousands) | Price Relatives | | | | |
| | | | 1 Year | 2 Years | 3 Years | 4 Years | 5 Years |
| 1 | CUY AMEL FRUIT CO. | \$ 2,942 | 135.0 | 99.3 | 90.6 | 61.8 | 99.8 |
| 2 | HOUSEHOLD PRODUCTS, INC. ... | 9,350 | 97.1 | 105.7 | 132.4 | 142.1 | 195.8 |
| 4 | INLAND STEEL | 8,006 | 72.2 | 85.8 | 80.8 | 93.7 | 115.9 |
| 4 | EATON AXLE & SPRING CO. .. | 4,200 | 51.7 | 50.4 | 91.2 | 87.5 | 116.5 |
| 5 | MUNSING WEAR, INC. | 3,780 | 81.2 | 75.0 | 84.5 | 87.2 | 137.5 |
| 11 | WM. WRIGLEY JR. & CO. | 12,000 | 111.2 | 140.5 | 132.5 | 165.0 | 190.0 |
| 12 | NATIONAL DAIRY CORP. | \$ 4,125 | 129.2 | 233.7 | 223.9 | 195.3 | 358.2 |
| | | 1924 | | | | | |
| 3 | TRANSCONTINENTAL OIL CO. .. | \$ 8,000 | 117.2 | 93.8 | 112.5 | 195.2 | 248.5 |
| 6 | GAME WELL CO. | 3,000 | n.a. | n.a. | 112.5 | 140.1 | 156.0 |
| 11 | BRUNSWICK BALKE-CALLENDER | 6,435 | 65.4 | 70.3 | 67.9 | 113.5 | 46.2 |
| 12 | LONG-BELL LUMBER CO. | 7,912 | 93.7 | 80.4 | 53.1 | 55.9 | 24.6 |
| 12 | (FRANK G.) SHATTUCK CO. .. | 2,750 | 252.2 | 229.5 | 327.3 | 444.3 | 460.9 |
| 12 | THE SYMINGTON CO. | \$ 996 | 95.0 | 87.1 | 87.9 | 30.1 | 20.9 |
| | | 1925 | | | | | |
| 1 | MUSIC MASTER CORP. | \$ 3,000 | 15.6 | 0.0 | 0.0 | 0.0 | 0.0 |
| 2 | THE GOULD COUPLER CO. | 3,675 | 82.0 | 35.0 | 36.5 | 30.0 | 36.5 |
| 2 | THE CUDAHAY PACKING CO. .. | 4,280 | 85.5 | 48.7 | 64.7 | 61.6 | 42.1 |
| 4 | DODGE BROS. INC. ^a | 20,986 | 110.6 | 79.2 | 86.3 | 75.3 | 31.8 |
| 4 | GABRIEL SNUBBER MFG. CO. .. | 4,950 | 132.5 | 138.7 | 77.5 | 92.0 | 34.0 |
| 5 | SUN OIL CO. | 5,767 | 88.4 | 91.1 | 136.5 | 190.2 | 218.7 |
| 6 | HUNT BROS. PACKING CO. ... | 2,600 | n.a. | 89.6 | 91.4 | 90.4 | 81.7 |
| 7 | ATLAS PLYWOOD CORP. | 2,500 | 120.0 | 104.8 | 169.5 | 109.1 | 37.5 |
| 7 | LEHN & FINK PRODUCTS | 8,578 | 99.5 | 99.0 | 132.7 | 140.9 | 81.5 |
| 8 | THE MAYTAG CO. | 5,000 | 114.0 | 158.8 | 89.4 | 128.1 | 56.9 |
| 8 | VICK CHEMICAL CO. | 4,100 | 118.4 | 136.7 | 164.8 | 175.1 | 164.6 |
| 8 | INDUSTRIAL RAYON CORP. | 3,000 | 42.5 | 47.8 | 85.2 | 99.8 | 91.9 |
| 9 | SAFETY INSULATED WIRE & CABLE CO. ^b | 6,250 | 104.6 | 133.2 | 145.0 | 219.0 | 72.4 |
| 10 | TUNG-SOL LAMP WORKS INC. . | 2,940 | 98.0 | 116.9 | 142.8 | 220.5 | n.a. |
| 10 | AMERICAN BROWN BOVERI ELEC- TRIC | 13,000 | 76.5 | 19.6 | 28.6 | 35.2 | 26.5 |
| 10 | GOTHAM SILK HOSIERY CO. ... | 2,750 | 205.4 | 285.4 | 280.4 | 134.2 | 33.1 |
| 10 | WESTERN DAIRY | 3,600 | 100.0 | 115.8 | 129.9 | 116.9 | 51.1 |
| 11 | FOX THEATRE CORP. | 12,500 | 95.7 | 77.2 | 115.0 | 50.3 | 28.0 |
| 11 | RICE-STIX DRY GOODS CO. ... | 2,650 | 76.9 | 82.1 | 71.2 | 55.7 | 37.3 |
| 12 | CONSOLIDATED LAUNDRIES CORP. | \$ 2,750 | 98.9 | 71.0 | 86.1 | 48.0 | 59.4 |

^aAcquired by Chrysler Motors on July 30, 1928.

^bName changed to Safety Cable Co., October 6, 1925, and changed to General Cable Co. November 14, 1927.

TABLE A-1 (Continued)

COMMON STOCKS

| Month | Stock Name | 1926 Value of Issue (thousands) | Price Relatives | | | | |
|-------------|--|---------------------------------------|-----------------|---------|---------|---------|---------|
| | | | 1 Year | 2 Years | 3 Years | 4 Years | 5 Years |
| 1 | NORTH AMERICAN CAR CORP. . . | \$ 2,588 | 94.4 | 106.6 | 210.7 | 128.2 | 95.2 |
| 1 | CONGRESS CIGAR Co., INC. | 2,800 | 135.0 | 200.8 | 204.2 | 113.1 | 56.2 |
| 1 | BEACON OIL Co. ^c | 5,700 | 105.3 | 84.2 | 122.0 | 78.3 | 52.0 |
| 2 | AMERICAN HOME PRODUCTS CORP. | 5,962 | 120.8 | 238.2 | 290.6 | 221.2 | 217.9 |
| 2 | GRIEF BROS. COOPERAGE Co. ... | 2,560 | 105.6 | 106.9 | 100.6 | 56.2 | 50.8 |
| 2 | AMERADA CORP. | 3,250 | 141.6 | 112.5 | 123.6 | 74.5 | 74.5 |
| 3 | LAMBERT Co. | 7,958 | 176.5 | 223.8 | 234.5 | 255.7 | 205.8 |
| 7 | AMERICAN SOLVENTS & CHEMI- CALS | 632 | n.a. | 158.7 | 270.5 | 61.3 | 9.9 |
| 8 | LIQUID CARBONIC CORP. | 3,220 | 102.9 | 178.6 | 267.3 | 205.3 | 61.5 |
| 9 | PENN-DIXIE CEMENT Co. | 12,900 | 59.6 | 34.0 | 21.5 | 15.7 | 4.0 |
| 11 | PACIFIC-CLAY PRODUCTS | 2,800 | 100.9 | 98.7 | 105.4 | 54.9 | 33.9 |
| 12 | PATINO-MINES ENTERPRISES CONSOL. | 5,000 | 89.8 | 132.7 | 117.2 | 34.0 | 26.0 |
| 12 | FULTON SYLPHON Co. ^d | \$ 3,900 | 118.4 | 115.4 | 64.1 | 32.2 | 22.4 |
| <u>1927</u> | | | | | | | |
| 1 | NATIONAL TILE Co. | \$ 2,970 | n.a. | 105.3 | 82.2 | 21.2 | 8.3 |
| 3 | W. T. GRANT Co. | 2,688 | 250.0 | 267.6 | 71.3 | 72.6 | 60.6 |
| 3 | MANDEL BROS. INC. | 3,638 | 78.4 | 71.1 | 29.8 | 10.4 | 5.2 |
| 6 | PILLSBURY FLOUR MILLS, INC. | 3,500 | 37.2 | 43.8 | 30.0 | 27.5 | 13.2 |
| 8 | (JOHN W.) WATSON Co. | 4,900 | 27.6 | 13.5 | 8.6 | 1.6 | 1.3 |
| 10 | HERSHEY CHOCOLATE CORP. ... | 3,468 | 174.3 | 311.8 | 243.0 | 238.4 | 169.4 |
| 11 | NATIONAL RADIATOR CORP. ... | 2,535 | 45.2 | 9.8 | 3.2 | 00.3 | 00.0 |
| 11 | UNITED BISCUIT Co. OF AMERICA | 2,800 | 181.9 | 130.8 | 126.8 | 95.8 | 66.5 |
| 12 | McKEESPORT TIN PLATE Co. .. | \$ 6,000 | 120.0 | 106.2 | 114.4 | 80.2 | 74.8 |
| <u>1928</u> | | | | | | | |
| 1 | CONSOLIDATED FILM INDUSTRIES | \$ 1,575 | 83.1 | 63.5 | 46.2 | 19.0 | 13.8 |
| 2 | NATIONAL TRADE JOURNAL INC. | 2,529 | 29.8 | 12.3 | 3.0 | 0.0 | 0.0 |
| 3 | CUTLER-HAMMER MFG. Co. ... | 3,088 | 129.7 | 219.5 | 84.6 | 21.2 | 13.9 |
| 4 | NEVE DRUG STORES, INC. ^e | 4,000 | 56.2 | 23.3 | 14.8 | n.a. | n.a. |
| 5 | H. W. GOSSARD Co. | 2,588 | 90.0 | 64.8 | 12.8 | 2.0 | 4.6 |
| 5 | SPIEGEL, MAY, STERN & Co. .. | 4,060 | 178.6 | 57.3 | 13.4 | 2.8 | 10.3 |
| 6 | GRASSELLI CHEMICAL Co. ^f | 4,700 | 274.0 | 155.3 | 129.2 | 33.7 | 112.8 |
| 6 | INTERNATIONAL PRINTING INK CORP. | 4,945 | 119.8 | 83.7 | 18.3 | 9.3 | 27.0 |
| 6 | NATIONAL AVIATION CORP. | 3,525 | 281.7 | 52.7 | 27.5 | 14.6 | 45.0 |
| 6 | THE WAYNE PUMP Co. | 820 | 52.1 | 35.7 | 8.2 | 1.2 | 2.2 |

^c Name changed to Colonial Beacon Oil, 1930.

^d Acquired by Reynolds Metal Co. January, 1929.

^e Acquired by United Retail Chemists in December, 1928.

^f Acquired by Curtiss Wright in August, 1929.

TABLE A-1 (Continued)

| COMMON STOCKS | | | | | | | |
|---------------|--|-------------------------------|-----------------|---------|---------|---------|---------|
| 1928 | | | | | | | |
| Month | Stock Name | Value of Issue (thousands) | Price Relatives | | | | |
| | | | 1 Year | 2 Years | 3 Years | 4 Years | 5 Years |
| 6 | CONSOLIDATED AUTOMATIC MERCHANDISING | \$ 824 | 55.9 | 6.8 | 2.3 | 0.7 | 3.4 |
| 7 | KIMBERLY-CLARK CORP. | 7,280 | 99.5 | 102.9 | 60.9 | 19.2 | 41.9 |
| 9 | ANCHOR CAP CORP. | 4,239 | 166.5 | 96.5 | 46.2 | 25.3 | 62.9 |
| 9 | CURTIS FLYING SERVICES | 9,450 | 146.4 | 35.7 | 16.1 | 11.9 | 17.9 |
| 10 | HERSHEY CORP. ^h | 1,338 | 94.2 | 18.5 | 11.4 | 8.0 | 9.8 |
| 10 | SONORA PRODUCTS | 3,000 | 15.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 10 | ALLIED PRODUCTS CORP. | 2,500 | 120.1 | 33.8 | 20.0 | 11.5 | 12.8 |
| 10 | LANE DRUG STORES INC. | 785 | 60.5 | 4.1 | 1.3 | n.a. | n.a. |
| 11 | JOSEPH T. RYERSON & SON | 3,900 | 84.6 | 66.0 | 37.7 | 19.2 | 31.4 |
| 11 | ASSOCIATED RAYON CORP. | 3,352 | 12.7 | 3.7 | 6.2 | n.a. | n.a. |
| 11 | BELLANCA AIRCRAFT CORP. | 2,972 | 31.9 | 16.8 | 6.4 | 2.6 | 17.0 |
| 11 | UNITED AIRCRAFT & TRANSPORT | 1,116 | 112.5 | 69.0 | 38.6 | 59.9 | 74.1 |
| 11 | GREAT LAKES AIRCRAFT CORP. | 4,900 | 32.4 | 9.2 | 10.2 | 2.5 | 2.8 |
| 11 | RANIER PULP & PAPER CO. | 3,325 | 81.2 | 36.1 | 30.1 | 19.6 | 58.6 |
| 11 | RITTER DENTAL MFG. CO. | 2,580 | 102.3 | 70.4 | 29.2 | 20.9 | 23.3 |
| 11 | UNIVERSAL AVIATION | 4,300 | 40.7 | 23.5 | 16.1 | 35.3 | 44.3 |
| 11 | PACIFIC WESTERN OIL CORP. .. | 16,080 | 58.3 | 38.5 | 20.8 | 17.7 | 32.3 |
| 11 | MERRITT-CHAPMAN & SCOTT .. | 2,500 | 84.5 | 72.0 | 40.0 | 1.1 | 19.2 |
| 11 | STRAUSS (NATHAN) INC. | 2,695 | 54.9 | 20.4 | 0.2 | 0.0 | 0.0 |
| 12 | ALUMINUM GOODS MFG. CORP. | 4,000 | 113.1 | 71.6 | 49.7 | 42.2 | 46.2 |
| 12 | HELENA RUBINSTEIN | 3,147 | 28.4 | 8.3 | 3.8 | 3.2 | 1.9 |
| 12 | HAHN DEPT. STORES | 17,252 | 39.0 | 20.7 | 8.6 | 4.0 | 14.1 |
| 12 | KROGER GROCERY & BAKING .. | 9,194 | 51.5 | 21.8 | 21.4 | 18.9 | 26.4 |
| 1949 | | | | | | | |
| 1 | BETHLEHEM STEEL CORP. | \$20,409 | 99.0 | 171.0 | 161.4 | 172.1 | 165.8 |
| 1 | AFFILIATED GAS EQUIP., INC. | 9,250 | 113.5 | 106.2 | 97.3 | 104.8 | 86.5 |
| 1 | KOPPERS CO., INC. | 12,400 | 94.0 | 122.8 | 152.6 | 128.6 | 102.6 |
| 3 | SYLVANIA ELECTRIC PRODUCTS, INC. | 5,469 | 99.8 | 130.6 | 176.8 | 162.3 | 178.2 |
| 4 | LIGGETT & MYERS TOBACCO CO. | 38,729 | 163.9 | 135.5 | 128.2 | 151.8 | 121.4 |
| 1950 | | | | | | | |
| 4 | DUMONT (A.B.) LABS, INC. ... | \$ 6,250 | 43.9 | 46.4 | 38.8 | 26.6 | 40.2 |
| 6 | SUNRAY OIL CORP. ⁱ | 9,469 | 152.5 | 166.4 | 139.1 | 151.5 | 201.1 |
| 9 | CANADIAN SUPERIOR OIL OF CALIFORNIA, (LTD.) | 19,350 | 145.6 | 121.2 | 72.5 | 108.8 | 120.0 |
| 10 | KAISER STEEL CORP. | 31,616 | 104.0 | 102.5 | 102.5 | 112.6 | 120.2 |
| 12 | INTERNATIONAL MIN. & CHEM. | 10,224 | 75.4 | 77.6 | 58.7 | 77.1 | 60.4 |

^gAcquired by DuPont Chemical Co. November 1928.

^hName changed to Houdaille-Hershey Corp. January 30, 1929.

ⁱName changed to Sunray Mid-Continent Oil Company, 1955.

TABLE A-1 (Continued)

COMMON STOCKS

1951

| Month | Stock Name | Value of Issue (thousands) | Price Relatives | | | | |
|-------|--|-------------------------------|-----------------|---------|---------|---------|---------|
| | | | 1 Year | 2 Years | 3 Years | 4 Years | 5 Years |
| 3 | JONES & LAUGHLIN STEEL CORP. | \$25,250 | 92.6 | 90.4 | 84.9 | 139.8 | 197.0 |
| 3 | KIMBERLY CLARK CORP. | 9,000 | 102.1 | 96.1 | 119.4 | 202.8 | 235.6 |
| 5 | SYLVANIA ELECTRIC PRODUCTS INC. | 11,650 | 114.8 | 121.3 | 121.9 | 158.0 | 177.9 |
| 6 | SQUIBB (E.R.) & SONS ^j | 15,375 | 49.5 | 41.6 | 53.0 | 68.3 | 62.8 |
| 10 | ALUMINIUM LTD. | 7,095 | 94.9 | 87.5 | 125.8 | 197.4 | 237.8 |
| 10 | SHARON STEEL CORP. | 7,314 | 81.9 | 80.7 | 69.0 | 106.9 | 110.0 |
| 10 | LION OIL ^k | 14,788 | 82.7 | 71.9 | 98.2 | 155.8 | 131.1 |
| 12 | FEDERATED DEPT. STORES | 10,030 | 112.8 | 99.6 | 141.9 | 173.9 | 157.3 |

1952

| | | | | | | | |
|----|--|----------|-------|-------|-------|-------|-------|
| 2 | KOPPERS Co. | \$11,250 | 85.3 | 76.4 | 103.9 | 119.4 | 120.6 |
| 2 | OWENS-CORNING FIBERGLASS .. | 16,088 | 125.2 | 156.6 | 196.1 | 281.4 | 312.6 |
| 2 | RHEEM MFG. Co. | 6,200 | 89.1 | 88.3 | 141.7 | 110.5 | 60.1 |
| 2 | MARATHON CORP. | 10,900 | 86.7 | 80.3 | 108.9 | 137.8 | 107.8 |
| 2 | MONSANTO CHEMICAL Co. | 39,200 | 94.0 | 86.2 | 108.2 | 135.6 | 96.6 |
| 3 | GA.-PACIFIC PLYWOOD & LUMBER Co. ^l | 5,250 | 81.2 | 53.9 | 127.4 | 217.7 | 292.7 |
| 3 | CAN. CHEM. & CELLULOSE Co. | 7,750 | 81.0 | 53.6 | 67.0 | 64.9 | 48.0 |
| 5 | LION OIL Co. ^m | 16,048 | 86.9 | 100.3 | 122.4 | 156.6 | 133.9 |
| 5 | FOOD MACH. & CHEMICAL | 13,425 | 82.7 | 95.4 | 112.0 | 147.5 | 139.1 |
| 5 | FEDERATED PETROL. LTD. ⁿ | 5,175 | 52.9 | 38.6 | 49.6 | 59.5 | 100.1 |
| 7 | DEERE & Co. | 22,121 | 81.4 | 90.1 | 113.7 | 86.1 | 91.2 |
| 8 | PILLSBURY MILLS | 5,640 | 107.0 | 139.7 | 155.1 | 143.2 | 131.8 |
| 12 | COLORADO FUEL & IRON | 6,000 | 89.6 | 120.6 | 167.0 | 180.4 | 109.0 |

1953

| | | | | | | | |
|---|-----------------------------|----------|-------|-------|-------|-------|-------|
| 2 | SYLVANIA ELECTRIC PRODS. .. | \$20,141 | 92.7 | 135.4 | 135.9 | 122.4 | 108.5 |
| 4 | CLEVELÉ CORP. | 5,076 | 82.7 | 86.7 | 84.7 | 81.8 | 65.0 |
| 4 | P. LORILLARD | 8,290 | 105.9 | 96.8 | 85.0 | 72.9 | 226.9 |
| 9 | STAUFFER CHEMICAL | 7,750 | 148.0 | 221.5 | 299.4 | 262.6 | 343.4 |

1954

| | | | | | | | |
|----|---------------------------------------|----------|-------|-------|-------|-------|-------|
| 1 | COLORADO OIL & GAS | \$12,500 | 108.0 | 128.0 | 154.0 | 108.5 | 132.5 |
| 2 | WAGNER ELECTRIC CORP. | 5,400 | 87.8 | 95.5 | 136.1 | 107.6 | 143.8 |
| 4 | AMERICAN TIDE LANDS ^o | 20,000 | 11.8 | 8.8 | 6.5 | 1.7 | 4.2 |
| 12 | MONTEREY OIL Co. | 10,950 | 91.1 | 88.5 | 58.2 | 96.1 | 64.0 |

^j Merged with (Olin) Mathieson (Chemical) Corp. 1952.

^k Acquired by Monsanto Chemical September 30, 1955.

^l Name changed to Ga.-Pacific Corp., April 1956.

^m Acquired by Monsanto September 30, 1955.

ⁿ Merged with Home Oil December 1955.

^o Name changed to Marine Drilling Inc. September 1, 1957.

TABLE A-1 (Continued)

COMMON STOCKS

1955

| <u>Month</u> | <u>Stock Name</u> | <u>Value of Issue (thousands)</u> | <u>Price Relatives</u> | | | | |
|--------------|---|---|------------------------|----------------|----------------|----------------|----------------|
| | | | <u>1 Year</u> | <u>2 Years</u> | <u>3 Years</u> | <u>4 Years</u> | <u>5 Years</u> |
| 1 | UNITED ARTISTS THEATRE CIRCUIT | \$ 6,802 | 50.0 | 34.9 | 25.7 | 56.2 | 50.7 |
| 2 | ALLIED STORES CORP. | 16,425 | 96.7 | 76.6 | 77.3 | 102.6 | 98.1 |
| 4 | STORER BROADCASTING Co. | 6,469 | 99.2 | 113.7 | 93.2 | 130.0 | 116.3 |
| 10 | COPPERWELD STEEL Co. | 6,000 | 115.5 | 109.5 | 132.5 | 196.3 | 135.0 |
| 11 | MARQUETTE CEMENT MFG. | 8,688 | 98.0 | 84.2 | 152.9 | 136.7 | 139.6 |
| 11 | KIMBERLY-CLARK CORP. | 18,552 | 93.4 | 94.1 | 148.2 | 144.2 | 177.2 |
| 12 | LECUNO OIL CORP. | 4,060 | 61.6 | 41.0 | 35.7 | 17.9 | 10.7 |
| 12 | MINUTE MAID CORP. | 6,900 | 59.8 | 29.0 | 100.4 | 118.0 | 207.2 |

(TABLE A-2 Follows)

TABLE A-2
PREFERRED STOCKS

| Month | Stock Name | 1923 Value of Issue (thousands) | Price Relatives | | | | |
|-------|---|--|-----------------|---------|---------|---------|---------|
| | | | 1 Year | 2 Years | 3 Years | 4 Years | 5 Years |
| 1 | (EDWARD G.) BUDD MFG. | \$ 3,000 | n.a. | n.a. | n.a. | n.a. | 73.7 |
| 1 | HAMMERHILL PAPER Co. | 3,000 | 101.0 | 105.0 | 108.8 | 108.8 | 109.0 |
| 1 | RELIANCE MFG. Co. | 2,500 | 96.2 | 87.1 | 88.4 | 99.0 | 99.2 |
| 1 | ARMOUR & Co. | 60,000 | 93.6 | 93.2 | 98.4 | 95.2 | 90.0 |
| 1 | LYON & HEALY, INC. | 2,500 | 98.2 | 103.5 | 110.0 | * | * |
| 1 | AMERICAN ROLLING MILL | 7,000 | 100.5 | 107.2 | 110.2 | 112.8 | 110.0 |
| 2 | ONYX HOSIERY, INC. ^a | 3,500 | 89.5 | 80.5 | 97.5 | 114.3 | 122.2 |
| 2 | NATIONAL DEPARTMENT STORES | 5,000 | 95.5 | 99.5 | 95.8 | 91.5 | 91.2 |
| 2 | ROSENBAUM GRAIN CORP. | 3,625 | 95.1 | 94.1 | 7.8 | 29.4 | 33.3 |
| 3 | AMERICAN CHAIN Co. | 8,750 | 87.0 | 93.9 | 94.6 | 118.6 | * |
| 3 | NATIONAL CLOAK & SUIT Co. ^b | 4,000 | 93.5 | 101.0 | 84.5 | 90.8 | 99.9 |
| 4 | INLAND STEEL | 10,000 | 98.0 | 100.6 | 105.3 | 108.4 | 111.4 |
| 5 | SHERMAN CLAY & Co. | 3,000 | n.a. | n.a. | 94.8 | 97.7 | 98.6 |
| 9 | REMINGTON ARMS Co. INC. ... | 4,000 | n.a. | n.a. | 100.3 | 94.1 | 101.6 |
| 11 | PALMOLIVE Co. ^c | 4,000 | n.a. | n.a. | n.a. | 107.9 | 110.0 |
| 1924 | | | | | | | |
| 9 | FRANKLIN SIMON & Co. | \$ 4,000 | 101.7 | 103.9 | 107.1 | 104.6 | 96.4 |
| 10 | R. HOE & Co. INC. | 4,000 | 90.0 | 59.0 | 66.0 | 38.0 | 52.0 |
| 12 | UNIVERSAL PICTURES CORP. ... | 3,000 | 94.9 | 97.8 | 99.1 | 93.5 | 39.5 |
| 12 | THE SYMINGTON Co. | 4,504 | 51.8 | 24.2 | 19.4 | 51.6 | 37.2 |
| 1925 | | | | | | | |
| 2 | ARTLOOM CORP. | \$ 3,000 | 111.0 | 113.6 | 113.0 | 99.0 | 60.9 |
| 2 | FIRST NATIONAL PICTURES, INC. | 2,500 | 103.7 | 97.6 | 107.5 | 106.0 | 115.0 |
| 2 | SPEAR & Co. | 4,500 | 81.9 | 78.6 | 80.4 | 80.2 | 79.1 |
| 2 | GENERAL OUTDOOR ADVERTISING | 5,812 | 118.7 | 124.2 | 123.7 | 109.1 | 92.3 |
| 4 | DODGE BROS. INC. ^d | 64,014 | 108.2 | 99.2 | 96.3 | 152.7 | * |
| 7 | INTERNATIONAL CEMENT CORP.. | 6,750 | 101.8 | 106.8 | 107.3 | * | * |
| 7 | INTERNATIONAL MATCH CORP... | 20,250 | 144.9 | 157.9 | 229.4 | 203.6 | 173.2 |
| 7 | THE OUTLET Co. | 3,500 | 101.1 | 110.5 | 114.5 | 82.0 | 105.0 |
| 9 | (EDWARD G.) BUDD MFG. Co... | 2,500 | n.a. | n.a. | n.a. | 75.6 | 61.9 |
| 9 | REAL SILK HOSIERY Co. | 2,500 | n.a. | 88.8 | 93.0 | 97.1 | 89.5 |
| 10 | THE MILLER RUBBER Co. ^e | 4,000 | 96.6 | 96.6 | 77.8 | 42.5 | 13.1 |

*Issue retired.

^aAcquired by Gotham Silk December 1926.

^bName changed to Bellas Hess Co. March 1927.

^cName changed to Palmolive-Peet Company February 1927 and to Colgate-Palmolive-Peet Company June 1928.

^dAcquired by Chrysler Corp., July 30, 1928.

^eAcquired by B. F. Goodrich, March, 1930.

TABLE A-2 (Continued)

| PREFERRED STOCKS | | | | | | | |
|------------------|--|-------------------------------|-----------------|---------|---------|---------|---------|
| 1925 | | | | | | | |
| Month | Stock Name | Value of Issue (thousands) | Price Relatives | | | | |
| | | | 1 Year | 2 Years | 3 Years | 4 Years | 5 Years |
| 10 | NATIONAL TEA CO. | \$ 3,250 | 124.8 | 164.4 | 287.2 | 250.0 | 71.0 |
| 10 | GOTHAM SILK HOSIERY CO. ... | 4,500 | 114.9 | 121.0 | 111.0 | 82.9 | 68.6 |
| 11 | FIRESTONE TIRE & RUBBER CO. | 10,000 | 98.8 | 107.9 | 108.0 | 111.1 | * |
| 12 | ST. MAURICE VALLEY CORP. ... | 3,806 | n.a. | 100.4 | 96.6 | 91.0 | 50.0 |
| 12 | ABRAHAM & STRAUS, INC. ... | 4,250 | 110.1 | 110.8 | 109.6 | 104.4 | 106.4 |
| 12 | NEW YORK CANNERS INC. | 5,100 | 89.4 | 55.0 | 38.9 | 27.9 | 14.5 |
| 1926 | | | | | | | |
| 1 | CHANDLER CLEVELAND MOTORS ^f | \$ 3,360 | 48.0 | 35.3 | 40.8 | 11.2 | 4.4 |
| 1 | CROWN-WILLAMETTE PAPER CO. | 20,000 | 99.9 | 97.8 | 96.5 | 100.6 | 68.0 |
| 1 | WHITE SEWING MACHINE CO. ... | 5,000 | 113.5 | 109.1 | 112.8 | 58.5 | 13.8 |
| 1 | LOUISIANA OIL REFINING CORP. | 4,000 | 96.6 | 90.0 | 92.2 | 86.0 | 55.0 |
| 2 | BETHLEHEM STEEL CORP. | 35,000 | 107.7 | 120.6 | 121.8 | 126.4 | 121.4 |
| 2 | ZELLERBACH CORP. | 5,850 | 99.0 | 141.9 | 98.0 | 82.3 | 41.3 |
| 3 | COLLINS & AIKMAN CO. | 5,000 | 152.7 | 99.9 | 94.1 | 83.2 | 73.9 |
| 6 | AMERICAN SEATING CORP. | 3,000 | 123.3 | 99.3 | 92.7 | 28.0 | 12.7 |
| 7 | AMERICAN SOLVENTS & CHEM.. | 2,868 | 69.7 | 110.5 | 174.3 | 69.7 | 10.9 |
| 8 | THE HALLE BROS. CO. | 2,500 | 102.5 | 102.5 | 102.0 | 97.5 | 90.0 |
| 9 | SCULLIN STEEL CO. | 3,850 | 85.7 | 93.8 | 76.0 | 45.4 | 13.0 |
| 9 | PACIFIC COAST BISCUIT CO. ^g . | 2,910 | 99.5 | 88.7 | 101.6 | 359.9 | 352.5 |
| 9 | PENNSYLVANIA-DIXIE CEMENT | 7,215 | 94.1 | 75.8 | 44.7 | 40.4 | 10.1 |
| 10 | CENTRAL ALLOY STEEL CORP. ^h . | 6,189 | 100.5 | 103.5 | 104.2 | 69.5 | 17.8 |
| 10 | (EDWARD G.) BUDD MFG. CO. . | 3,000 | n.a. | 32.8 | 81.1 | 63.9 | 23.7 |
| 10 | BROADWAY DEPT. STORES | 3,000 | 108.4 | 102.3 | 93.4 | 71.7 | n.a. |
| 11 | GOTHAM SILK HOSIERY CO. ... | 5,000 | 117.2 | 117.0 | 83.1 | 62.3 | 58.8 |
| 12 | FLINTKOTE CO. | 2,500 | n.a. | 110.0 | * | * | * |
| 1927 | | | | | | | |
| 2 | GENERAL MOTORS CORP. | \$25,000 | 104.2 | 104.6 | 101.6 | 83.1 | 70.2 |
| 2 | L. BAMBERGER & Co. | 10,000 | 106.7 | 105.3 | 104.1 | 101.6 | 91.4 |
| 3 | AMERICAN CHAIN CO. | 11,000 | 100.3 | 82.0 | 94.0 | 35.6 | 17.5 |
| 3 | RICHFIELD OIL CO. OF CAL. .. | 5,000 | 111.2 | 180.5 | 107.0 | 24.7 | 2.5 |
| 4 | UNITED CIGAR STORES OF AMERICA | 20,000 | 104.7 | 92.2 | 40.8 | 70.0 | 8.3 |
| 5 | CROWN-ZELLERBACH CORP. | 2,992 | 127.3 | 92.0 | 81.2 | 21.6 | 13.8 |
| 5 | SUN OIL CO. | 4,500 | 109.8 | 102.9 | 104.1 | 95.0 | 73.4 |
| 6 | INTERNATIONAL PAPER CO. | 15,000 | 105.2 | 87.9 | 78.2 | 25.0 | 4.8 |
| 6 | PILLSBURY FLOUR MILLS INC. . | 3,000 | 111.4 | 109.4 | 75.0 | 68.8 | 33.1 |

*Issue Retired.

^fMerged with Hupp Motor Car, 1930.^gAcquired by National Biscuits, June, 1930.^hMerged with Republic Steel, April, 1930.

TABLE A-2 (Continued)

| PREFERRED STOCKS | | | | | | | |
|------------------|---|-------------------------------|-----------------|---------|---------|---------|---------|
| 1927 | | | | | | | |
| (Continued) | | | | | | | |
| Month | Stock Name | Value of Issue (thousands) | Price Relatives | | | | |
| | | | 1 Year | 2 Years | 3 Years | 4 Years | 5 Years |
| 7 | AUTO STRAP SAFETY RAZOR CO. ⁱ | \$ 3,762 | 104.9 | 99.7 | 145.4 | 163.1 | 157.6 |
| 7 | COLLINS & AIKMAN CORP. | 5,500 | 89.6 | 90.3 | 80.3 | 77.9 | 55.3 |
| 7 | PENNSYLVANIA GLASS SAND CORP. | 3,000 | n.a. | 115.0 | 105.0 | 90.0 | n.a. |
| 7 | FOSTER WHEELER CORP. | 3,500 | n.a. | n.a. | 205.0 | 100.0 | 75.0 |
| 8 | NATIONAL RADIATOR CORP. | 5,850 | 66.7 | 15.9 | 4.0 | 0.9 | 0.0 |
| 8 | WEBER & HEILBRONER, INC. ^j .. | 2,500 | 98.5 | 90.6 | 49.0 | 13.7 | 4.9 |
| 10 | HERSHEY CHOCOLATE CORP. (6% cum. prior pref.) | 15,000 | 104.6 | 107.6 | 108.6 | * | * |
| 10 | HERSHEY CHOCOLATE CORP. (conv. pref. cum. \$4/sh.) | 22,432 | 124.4 | 221.3 | 143.5 | 132.6 | 122.3 |
| 10 | ST. REGIS PAPER CO. | 2,740 | 86.3 | 99.0 | 106.4 | n.a. | 30.9 |
| 12 | THE CUNEO PRESS INC. | 2,500 | 92.4 | 78.7 | 89.0 | 65.4 | 61.7 |
| 12 | GEORGE A. FULLER CO. | 4,478 | 104.9 | 96.5 | 82.9 | 30.2 | 9.2 |
| 12 | F. & W. GRAND 5-10-25¢ STORES | 2,500 | 72.8 | 38.6 | 21.4 | 2.4 | 0.9 |
| 12 | LOEWS INC. | 15,000 | 101.4 | 44.3 | 90.5 | 59.2 | 59.6 |
| 1928 | | | | | | | |
| 1 | GENERAL TIRE & RUBBER CO. .. | \$ 3,500 | 99.5 | 88.7 | 82.4 | 58.3 | 35.3 |
| 1 | CONSOLIDATED FILM INDUSTRIES | 6,375 | 126.2 | 92.3 | 82.1 | 50.6 | 43.2 |
| 1 | WALGREEN COMPANY | 4,500 | 95.5 | 91.0 | 85.0 | 64.7 | 92.4 |
| 2 | HAMILTON WATCH CO. | 4,800 | 100.2 | 103.5 | 102.0 | 64.7 | 19.9 |
| 2 | UNITED PIECE DYE WORKS ... | 3,750 | 103.4 | 93.7 | 102.2 | 88.4 | 68.0 |
| 2 | INTERSTATE DEPT. STORES INC. | 3,250 | 128.3 | 70.8 | 58.0 | 46.0 | 17.4 |
| 2 | KEITH-ALBEE ORPHEUM CO. .. | 10,000 | 112.4 | 99.5 | 94.3 | 24.8 | 10.9 |
| 2 | NEISNER BROS. INC. | 2,500 | 178.3 | 106.5 | 68.9 | 2.8 | 12.8 |
| 2 | SCHULTE-UNITED 5¢-\$1 STORE . | 10,000 | 76.0 | 18.0 | 1.1 | 0.0 | 0.0 |
| 3 | SPANG CHALFANT & CO. INC... | 2,500 | 94.9 | 96.9 | 93.4 | 43.4 | 20.7 |
| 3 | BARKER BROS. CORP. | 3,000 | 96.0 | 78.5 | 55.0 | 25.0 | 1.1 |
| 3 | STANDARD DREDGING COMPANY | 4,350 | 123.3 | 103.4 | 33.2 | 7.8 | 2.1 |
| 4 | BROWN CO. | 10,000 | 97.4 | 28.3 | 34.0 | 4.7 | 2.8 |
| 4 | CAVANAGH-DOBBS, INC. ^k | 3,500 | 96.4 | 70.2 | 22.0 | 7.6 | 6.0 |
| 4 | UNIT CORP. OF AMERICA | 3,135 | 98.2 | 79.0 | 16.7 | 0.9 | 0.0 |
| 4 | METROPOLITAN CHAIN STORES . | 3,500 | 99.1 | 72.6 | 8.7 | 0.0 | 0.0 |
| 4 | PEOPLES DRUG STORE, INC. | 2,500 | 107.9 | 100.5 | 95.6 | 81.9 | 60.5 |
| 4 | CONSUMERS CO. | 5,000 | 79.0 | 67.4 | 41.6 | 4.2 | 1.6 |
| 5 | I. MILLER & SONS, INC. | 2,500 | 90.5 | 77.1 | 39.3 | 13.9 | 5.8 |
| 5 | SPEIGEL, MAY, STERN & Co. .. | 7,000 | 89.2 | 69.4 | 17.6 | 19.8 | 35.1 |
| 6 | BORG WARNER | 3,500 | 109.8 | 95.0 | 95.6 | 51.7 | 85.7 |
| 6 | HART-CARTER CO. | 4,480 | 78.9 | 56.6 | 20.3 | 7.8 | 25.2 |
| 6 | INTERNATIONAL PRINTING INK CORP. | 7,000 | 95.7 | 94.0 | 59.1 | 31.7 | 68.1 |

*Issue Retired.

ⁱAcquired by Gillette Safety Razor, November, 1930.^jName changed to Fashion Park, 1929.^kMerged with Hat Corp. May, 1932.

TABLE A-2 (Continued)

| | | PREFERRED STOCKS | | | | | |
|-------|---|-------------------------------|-----------------|---------|---------|---------|---------|
| | | 1928 | | | | | |
| Month | Stock Name | Value of Issue (thousands) | Price Relatives | | | | |
| | | | 1 Year | 2 Years | 3 Years | 4 Years | 5 Years |
| 6 | THE WAYNE PUMP CO. | \$ 2,218 | 78.1 | 65.9 | 30.4 | 5.2 | 4.7 |
| 6 | CALIFORNIA DAIRIES INC. | 4,312 | 50.4 | 44.9 | 21.4 | 4.1 | 9.8 |
| 6 | CONSOLIDATED AUTOMATIC MER- CHANDISING | 10,176 | 38.8 | 6.9 | 1.0 | 0.3 | 1.5 |
| 6 | CROSSE & BLACKWELL, INC. ... | 2,704 | 94.7 | 71.2 | 46.8 | n.a. | n.a. |
| 6 | LEATH & Co. | 2,642 | 78.8 | 65.4 | 17.3 | 13.5 | 8.2 |
| 7 | MILLER & HART INC. | 2,860 | 82.0 | 60.6 | 33.6 | 15.4 | 22.1 |
| 9 | ANCHOR CAP CORP. | 3,060 | 139.3 | 104.9 | 85.3 | 69.2 | 88.0 |
| 9 | KENDALL Co. | 3,888 | 88.7 | 68.0 | 40.5 | 26.2 | 67.0 |
| 9 | McKESSON & ROBBINS | 9,889 | 107.4 | 77.4 | 57.4 | 18.1 | 40.0 |
| 10 | HOUDAILLE-HERSHEY CORP. ... | 1,329 | 97.2 | 44.2 | 40.3 | 19.8 | 26.9 |
| 10 | MULLINS MFG. Co. | 3,060 | 83.3 | 40.3 | 22.7 | 15.4 | 10.4 |
| 10 | CHASE BRASS & COPPER Co. .. | 2,500 | 99.4 | 100.1 | 87.8 | 72.2 | 84.4 |
| 10 | MID-CONTINENT LAUNDRIES .. | 3,400 | 65.4 | 6.6 | 3.7 | n.a. | n.a. |
| 10 | LANE DRUG STORES, INC. | 1,717 | 79.5 | 3.8 | 2.4 | n.a. | n.a. |
| 11 | HOUDAILLE-HERSHEY CORP. .. | 3,598 | 61.9 | 38.7 | 40.2 | 21.0 | 31.7 |
| 11 | ASSOCIATED RAYON CORP. | 17,648 | 39.8 | 48.2 | 33.1 | * | * |
| 11 | UNITED AIRCRAFT & TRANS. CORP. | 4,194 | 112.5 | 116.3 | 103.0 | 118.8 | 131.6 |
| 11 | KRAFT PHENIX CHEESE ^l | 6,000 | 96.0 | 45.5 | 37.7 | 30.0 | 28.6 |
| 12 | THOMPSON & STANET Co. | 8,800 | 67.7 | 50.6 | 34.3 | 30.1 | 39.7 |
| 12 | HAHN DEPT. STORES | 22,700 | 76.6 | 54.8 | 30.3 | 12.9 | 24.9 |
| 12 | KOPPERS GAS & COKE | 20,000 | 98.5 | 97.0 | 63.6 | 49.5 | 59.4 |
| 12 | THE NEWPORT Co. ^m | 6,500 | 104.0 | 70.5 | 110.2 | 4.4 | 14.5 |
| | | 1949 | | | | | |
| 4 | MERCK & Co. INC. | \$ 7,192 | 130.4 | n.a. | 110.2 | 98.0 | 101.7 |
| 5 | UNITED BISCUIT Co. OF AMERICA | 8,280 | 104.1 | 103.6 | 101.4 | 98.8 | 102.9 |
| 6 | CATERPILLAR TRACTOR Co. | 25,000 | 105.1 | 102.9 | 103.8 | 98.5 | 102.5 |
| 11 | CLINTON INDUSTRIES INC. | 5,025 | 109.6 | 98.5 | 89.1 | 95.4 | 113.8 |
| | | 1950 | | | | | |
| 7 | SPENCER CHEMICALS | \$ 6,821 | 100.9 | 101.2 | 99.2 | 102.0 | 102.5 |
| 10 | KAISER STEEL CORP. | 31,616 | 104.0 | 102.5 | 102.5 | 112.6 | 120.2 |
| 11 | SAFeway STORES | 6,400 | 94.0 | 85.8 | 90.9 | 97.2 | 94.5 |
| | | 1951 | | | | | |
| 1 | CITY STORES Co. | \$ 6,000 | 86.1 | 82.1 | 75.8 | 96.0 | 105.8 |
| 1 | FOOD FAIR STORES, INC. | 8,000 | 94.2 | 97.2 | 93.5 | 100.0 | 101.2 |
| 6 | MINN.-HONEYWELL REGULATOR Co. | 16,000 | 108.8 | 105.4 | 103.4 | * | * |

*Issue Retired.

^lAcquired by National Dairy, June 4, 1930.^mName changed to Newport Industries, 1931.

TABLE A-2 (Continued)

PREFERRED STOCKS

1951

| Month | Stock Name | Value of Issue (thousands) | Price Relatives | | | | |
|-------|--------------------------------------|-------------------------------|-----------------|---------|---------|---------|---------|
| | | | 1 Year | 2 Years | 3 Years | 4 Years | 5 Years |
| 6 | PFIZER (CHAS.) & CO. INC. ... | \$15,000 | 110.7 | 93.8 | 103.3 | 113.8 | 98.7 |
| 6 | RHEEM MFG. CO. | 7,000 | 92.1 | 89.7 | 100.5 | 118.4 | 90.2 |
| 6 | NATIONAL TEA CO. | 12,000 | 105.0 | 107.9 | 125.9 | 104.0 | * |
| 8 | U. S. PLYWOOD CORP. | 6,150 | 94.1 | 82.6 | 88.8 | 99.8 | 116.8 |
| 8 | NATIONAL DISTILLERS PRODS. .. | 50,000 | 101.5 | 88.8 | 93.8 | 99.8 | 100.6 |
| 9 | NATIONAL CONTAINER | 12,600 | 87.1 | 74.3 | 92.6 | 141.7 | 231.4 |
| 10 | ASHLAND OIL & REFINING | 5,045 | 100.5 | 97.7 | 99.5 | 101.8 | 97.9 |
| 10 | SHELL MAR PRODUCTS ^a | 5,200 | 123.2 | 118.5 | 127.4 | * | * |
| 12 | (OLIN) MATHIESON CHEM. CORP. | 18,000 | 109.8 | 103.9 | 122.5 | 120.9 | 108.1 |
| 12 | DIAMOND ALKALI CO. | 12,000 | 108.2 | 100.1 | 114.1 | 116.8 | 103.0* |
| 12 | PITTSBURGH COKE & CHEM. .. | 6,000 | 94.2 | 78.4 | 84.0 | 92.2 | 90.5 |

1952

| | | | | | | | |
|---|--|----------|-------|-------|-------|-------|-------|
| 1 | KAISER ALUMINUM & CHEM... | \$18,750 | 92.5 | 95.2 | 169.4 | 104.0 | * |
| 1 | CONSOLIDATED GROCERS ^o | 9,800 | 86.2 | 92.9 | 99.0 | 103.6 | 98.8 |
| 1 | ATLAS PLYWOOD CORP. | 5,700 | 86.3 | 75.0 | 82.7 | 77.9 | 70.5 |
| 5 | ELLIOTT CO. | 6,000 | 107.5 | 102.1 | 101.8 | 94.5 | 104.2 |
| 6 | SAFEWAY STORES | 20,000 | 106.0 | 103.0 | * | * | * |

1953

| | | | | | | | |
|----|------------------------------|----------|-------|-------|-------|-------|---|
| 3 | P. R. MALLORY | \$ 7,500 | 109.5 | 109.5 | 105.5 | 105.0 | * |
| 11 | GENERAL PRECISION EQUIP. ... | 5,408 | 192.5 | 106.0 | * | * | * |
| 11 | DIXIE CUPP | 7,623 | 142.2 | 137.2 | 133.5 | 104.0 | * |

1954

| | | | | | | | |
|----|-------------------------------|----------|-------|-------|-------|------|-------|
| 2 | GULF SULPHUR CORP. | \$ 7,000 | 111.2 | 125.0 | 70.0 | 31.9 | 55.0 |
| 4 | I. T. E. CIRCUIT BREAKER | 5,000 | 101.8 | 97.0 | 93.0 | 74.4 | 92.1 |
| 5 | ALLIS-CHALMERS MFG. | 35,700 | 121.6 | 110.3 | 113.0 | 93.6 | 108.8 |
| 9 | SPENCER CHEMICAL CO. | 15,000 | 99.2 | 97.0 | 81.2 | 91.0 | 87.2 |
| 10 | MEAD CORP. | 7,800 | 132.9 | 103.8 | * | * | * |
| 11 | TUNG-SOL ELECTRIC | 5,000 | 111.5 | 103.5 | 103.6 | * | * |
| 11 | PENN. FRUIT CO. | 5,225 | 106.2 | 82.3 | 70.3 | 95.7 | 98.6 |

1955

| | | | | | | | |
|---|----------------------------|----------|-------|-------|-------|-------|-------|
| 3 | GENERAL TIRE & RUBBER | \$10,225 | 108.6 | 126.0 | 143.8 | 380.4 | 428.7 |
| 3 | WESTERN AUTO SUPPLY | 5,000 | 105.0 | 96.0 | 99.8 | 99.1 | 96.4 |
| 5 | MINN-HONEYWELL REGULATOR | 16,320 | 102.9 | * | * | * | * |
| 9 | KAISER ALUMINUM & CHEM. . | 35,000 | 97.8 | 84.0 | 84.0 | 92.0 | 92.0 |

*Issue retired.

^aName changed to General Package Corp., July 1953.^oName changed to Consolidated Foods Corp., February, 1954.^pAcquired by American Can, June, 1957.

