The San Francisco Nev

SAN FRANCISCO, TUESDAY, DECEMBER 28, 1948

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Makes Emeralds—Radio Crystals Next

Local 'Alchemist' Grows Gems 'Exactly Like Real Stones'

By Alex Streloff

The News Industrial Reporter

Carroll F. Chatham, the young San Francisco "alchemist" who has been making perfect emeralds since 1940, is now "just a few steps away" from making something far more valuable and far more important—piezoelectric crystals, absolutely vital in our radio age.

(Piezoelectric crystals, which transmit mechanical impulses into electrical impulses, are essential in electronic communications. Sound waves thus are changed into electrical frequences, for example, and the thickness into which the crystals are cut determines a fixed electrical frequency.)

SYNTHETIC EMERALDS

Certain types of high-grade quartz have been the best crystals, but natural sources (mostly in Brazil) are now nearing exhaustion. The radio industry is extremely concerned, but the national defense aspects of the shortage of frequency crystals are vital. Piezoelectric crystals are high on the list of strategic materials for stockpiling. A shortage of crystals is reported to have been one of Germany's most crucial handicaps during the later years of the war.

The frequency crystal on which Mr. Chatham is now working is a direct outgrowth of his fabulous success with synthetic emeralds. An age-old dream which has fired the imagination of writers of fantasy, Mr. Chatham's accomplishments have been recognized by top authorities.

LOWELL HIGH GRADUATE

Writing about synthetic gems in a recent issue of Science Illustrated, Frederick H. Pough, curator of physical geology and mineralogy of the American Museum of Natural History, stated:

"The biggest sensation at the moment is in San Francisco where a young man named Chatham, who began playing around with a chemistry set and a book of parlor chemical tricks when he was 10, has come up with some home-grown emeralds that are as fine, and in some respects finer, than nature's."

In 1930, when Mr. Chatham was a 16-year-old Lowell High School student, he first became interested in growing crystals. After a year, he produced one beryl crystal of microscopic size that was colorless but clear.

In 1935 he made his first commercial size emerald crystal of only fair quality. It took him three more years to rediscover what he had hit on by accident and to ex-

Carroll F. Chatham, "the emerald grower," inspects some crystals that failed to develop into gem-quality emeralds. About 94 per cent of his efforts end in worthless stones.

Hopes to Develop Highly Strategic Frequency Crystals

reproducible results. However, the process was still too expensive to use commercially.

In 1940, Mr. Chatham finally developed a commercial method to make large crystals of improved quality. From then until last July his monthly production averaged less than 100 carats of crystals in the rough. These were sold to lapidaries for cutting, polishing and resale. Only 30 per cent of the total rough production appeared as "good" quality cut stones, of which a third appeared as perfect gems.

1000 CARATS MONTHLY

Since July, he has been producing about 1000 carats of rough emerald crystals monthly.

According to the 34-year-old San Francisco chemist, there is only one way to distinguish his synthetic emeralds from natural gems — by exposing both to intense heat, which will crack the natural stone without damaging the synthetic.

At present, however, his stones are averaging only a half carat after cutting and polishing. Perfect cut stones are selling for about $80 a carat. It takes at least 10 months of expensive process to grow an emerald crystal and only 6 per cent are worth sending to the lapidary at all. The rest are valueless.

C.I.T. GRADUATE

Mr. Chatham graduated from the California Institute of Technology with a B.S. in chemistry in 1937. For eight years he was in the research laboratory of a leading Western food firm, and it was not until a few years ago that he was able to devote his full time to growing emerald crystals in his own one-man laboratory at 70 14th-st.

As a word of caution to potential burglars or burglars, who may have ideas of piles of priceless gems heaped in corners, Mr. Chatham points out that his laboratory's elaborate burglar alarm was installed to exclude intruders from his highly secret and highly dangerous process.

As he states it: "It isn't merely a possibility, but almost an absolute certainty that — if a burglar tinkering the equipment would be electrocuted or blown through the roof —thus disturbing months of work in the laboratory."

Besides, he points out that the trickle of gems is shipped out immediately.

Prices Sag as Volume Rises

Du Pont Decline Highlights Trading

By United Press

NEW YORK, Dec. 28.—A loss of more than 2 points in Du Pont highlighted a general decline in the stock market today as activity quickened to the best pace since last Nov. 10.

Sales to mid-day of 610,000 shares compared with only 380,000 yesterday and were the most for a two-hour period since 930,000 shares were traded to noon on Nov. 10.

The loss of 2¾ points in Du Pont was one of the widest on the "big board" and was followed by declines of a point or more in Chrysler and American Tobacco.

Goodyear, Bethlehem Steel, Standard Oil Company of California, Youngstown Sheet & Tube, American Can, Standard of N. J., Montgomery Ward, and U. S. Steel all were fractionally lower.

Only an occasional stock countered the trend, including Union Pacific, Union Carbide and Public Service Electric & Gas, all up minor amounts.

San Francisco Stock Exchange

All sales in hundreds (00 omitted) except those designated (*) which are traded in 10-share lots and carried in full. Dividends (c) paid in 1947; (d) payment on account of accumulations; (e) liquidating dividend; (h) payment or declared payable; (x) stock dividend; (y) an extra cash or stock dividend declared but not included in amount shown.

Sales Monday, Dec. 27: Shares, 23,1[illegible]; Market Value, $451,085.

Tuesday, Dec. 28.

Sales 8 a. m. to 12:30 p. m.

Sales	Stock and Dividend	High	Low	12:30	Net Chg.
7	Alaska Jun	2¼	2¼	2¼	—
1	Wesley Ex	54½	54½	54½	—
1	Anacomda 3	32	32	32	—
1	Angelo Sug (.10)	23¼	23¼	23¼	—
1	Am Pet & Ex	6	6	6	—
1	Armour .800	8½	8½	8½	—
8	Atlas Corp	3¼	3¼	3¼	—
2	Avco .60h	8¾	8¾	8¾	—
9	Boston Oil .10e	10½	10½	10½	—
21	Blair & Co .20h	2.40	2.30	2.30	—
1	Byron Jack 2e	24½	24½	24½	—
5	Cent Eureka	1.35	1.30	1.30	—
12	Columbia Gas 2e	7½	7½	7½	—
26	CONT Oil 2	32	31½	31½	—
1	Cons Vultee .10e	9	9	9	—
26	Consumers Co 1	8½	8½	8½	—
6	Crow Zell 1.600	28½	28½	28½	—
20	Do pfd 4.50	95	95	95	—
1	Di Giorl A .60h	11½	11½	11½	—
4	Doernbecher .600	5½	5½	5	—
1	Dunlop Oil 40c	27½	27½	27½	—
1	E Dorr O 1.00h	13½	13	13½	—
2	Eld Dupel .40h	31½	31½	31½	—
4	Emsworth	7	7	7	—
1	Food Mach 1½	27½	27½	27½	—
1	Gen Paint 1h	16	16	16	—
2	Glad McB 1.50	23½	23½	23½	—
10	Golden Sta 1.60	11½	11½	11½	—
50	Do pf 4	58½	58	58½	—
1	Haw Pipe 1	13½	13½	13½	—
7	Haw Pipe 2½h	16½	16½	16½	—
1	Holt Dev .04	7½	7½	7½	—
4	Honolulu Oil 6h	64½	64½	64½	—
4	Ill Mid Mines	1.40	1.40	1.40	—

Bay View Federal Votes 3 Pct. Dividend

Blair Buys Lucky

West. Pacific Has New Top Aides