

of stem material. There was also a trend toward an increase in the use of Turkish or aromatic tobacco.

Consistent trends in the use of burley and flue-cured tobaccos were not obvious. The relative use of these types seemed to depend upon particular company preference. One company shifted to the use of a much larger quantity of burley tobacco during the period of study, while another significantly reduced the burley content. The quantity of flue-cured or burley tobacco which went into the manufacture of the reconstituted tobacco could not be determined. Burley tobacco varied from 20 to 40 percent of the dried weight of the tobacco leaf used in the manufacture of cigarettes. Most companies used approximately 30 percent burley in their cigarettes. The use of flue-cured tobacco was found to vary from approximately 30 to 50 percent of the total weight of the tobacco.

Composition Varies Widely

The variations in blends probably represent an attempt on the part of the companies to produce a cigarette of definite smoking properties from the tobacco which was available. The wide variations indicate that the companies have considerable latitude in accomplishing this objective. In general, at the start of this study, it appeared that the use of burley was tending to decrease. On the other hand, near the end of the study the burley content tended to increase and flue-cured to decrease. This may have been influenced by the very mild flue-cured crops produced during 1955 and 1956. The variations in blends could also be correlated with what is known about the general buying policies of the companies. One is known to employ an area buying technique to help regulate the chemical characteristic of the raw materials used in the manufacture of their cigarettes. The cigarettes of this company were found to vary less from the standpoint of blend composition than those of any other company.

General Chemical Characteristics

For several years, nicotine determinations of cigarettes have been made in this laboratory from time to time. Prior to 1948 the nicotine content averaged very close to 2 percent and all brands had almost the same analysis. In 1953 and 1955 the cigarettes of some companies showed a marked increase in nicotine content, going as high as 3 percent in some instances. By the time of this study the nicotine content of those which had previously been 3 percent had been reduced markedly and, as shown in Table 1, all cigarettes were

found to contain between 1.84 and 2.41 percent nicotine. The analysis made near the end of the study (Table 1) indicates that the same range of alkaloid content still prevailed. However, some companies have tended to increase and others to decrease the nicotine content of their cigarettes. The average nicotine content of the regular, king-size and filter cigarettes is essentially the same. This would not be anticipated on the basis of the supposed use of stronger tobaccos in filter-type cigarettes. In addition to these figures, the blend data and visual observation made on the separated fractions would indicate that there is little if any difference in the tobaccos going into the cigarettes of various types. Table 1 shows that the nicotine content is apparently regulated by the companies.

Table 1.—The percentage total alkaloids (nicotine) found in the tobacco of cigarettes of different types manufactured by 6 major companies in 1956 and 1957.

Company	1956			1957		
	Regular	King-size	Filter	Regular	King-size	Filter
	Percent					
A	2.32	2.32	2.31	2.23	2.05	2.22
B	2.18	1.91	2.22	2.18	2.28	2.38
C	1.84	2.07	2.16	1.84	1.95	1.99
D	1.93	2.22	2.16	1.93	2.04
E	2.05	2.40	2.05	2.11	2.23
F	2.41	2.40	2.33	2.41	2.29	2.09
Average	2.15	2.13	2.27	2.15	2.10	2.16

Sugar analyses were also made on the total tobacco and on various fractions obtained from the cigarettes. The results indicate that the variation in sugar content is wider than the nicotine content when considered on a company-to-company basis but fairly uniform in the products of a given company. There is evidence that chemical concepts of smoking quality are becoming more important and that the entire tobacco manufacturing industry is rapidly going from one based on art and tradition to one based on modern technology.

Discussion

The cigarette industry of today is highly competitive and rapidly changing. The successful introduction of any innovation, such as the flip-top box or reconstituted tobacco, if it gives a competitive advantage to a company will probably become common practice in the industry. The study indicates that greater efforts are now being made by the industry as a whole to increase the efficiency of production, and research efforts in all phases of cigarette production are being

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