SPECIFYING INKS AND PAPERS FOR GOVERNMENT OFFICES

FOR MORE than forty centuries man has been trying to find and perfect a record ink which would adequately convey to posterity an account of his actions, feelings, and hopes. The earliest inks were those made from the juices of berries; then more ambitious souls gathered shells from the sea shore, which, when ground fine and mixed with water or other liquefying agents, became the conveyor of the scribe's message to a limited posterity. These inks were applied with a brush made either of chewed fiber or of hair. According to Carvalho, the first writing appeared between 1500 and 1800 B.C.

Specifying inks for government offices had its beginnings in the United States in 1894 when the legislature of Massachusetts authorized a standard ink and provided a penalty for failure to meet the adopted requirements. This standard was submitted to manfacturers and after bids had been received, a supply was purchased for the state by the secretary of the commonwealth who had the care of its distribution to all record offices in the state. Curiously enough, the ink approved was one of the iron gall tannate inks, similar in content to that which was concocted in the twelfth century from an effusion of gall nuts procured from oak trees in eastern Europe. The standard ink of Massachusetts was used as standard by Connecticut in 1895 when the legislature of that commonwealth passed the following law: "No person having the care or custody of any book of record or registry in any of the departments or offices of the state, or of any county, city, town, borough, or probate district therein, shall use, or allow to be used upon such books, any ink excepting such as is furnished by the secretary of this state." Section 3 of this same law states that "the inks so furnished, before acceptance by the secretary, shall be examined by a chemist to be designated by the secretary," etc. Soon after this, the federal government in its treasury department began ink standardization for use on official records.

Since 1903, supervision in the state of Connecticut has been in charge of the examiner of public records. This office was created by the legislature following advice from a commission which had been previously appointed. The duties of the examiner of public records are as follows: "Such examiner of public records shall cause such

action to be taken by persons having the care and custody of public records as may be necessary to put such records in the custody and condition required by the laws relating to such records and to secure their safety and preservation. . . ." "Before the examiner of public records shall approve of any ink, he shall cause a number of distinct and separate brands to be examined as to quality by a state chemist, and give his approval of not less than four different brands or manufactures, and the inks so approved shall be standard inks for use in this state."

The latest tests of inks and ribbons in Connecticut were made in 1938 after a special appropriation of six hundred dollars had been set aside by the state legislature for this purpose. At that time, twenty-five inks were placed in blank bottles which were then numbered. Concurrently, all identification marks were eliminated from fifty-five typewriter ribbons, each of which was given a number; the key in all cases being retained in the examiner's office so that the state chemist might not be influenced in either his test or report. Care had been taken to purchase all samples from retail stock excepting of course those few ribbons manufactured by mills having no retail outlet. The ink test covered first the "Chemical and Physical Characteristics" of each sample. Under this section, the sample was tested for sediment after twenty-four hours; for mold, scum, and sediment after two weeks with an opportunity to score ten points. The amount of iron contained in each one hundred cubic centimeters was determined with a minimum standard rating of five. In a "Streak Test," the character, color, amount of striking through, blackness after one week's time, and action on steel pens took a minimum standard rating of five points.

In "Effect of Reagents," the second subdivision of the "Streak Test," the samples were tested for loss of color after having been immersed in water twenty-four hours and in a fifty per cent alcohol solution for twenty-four hours. Samples were also immersed in a bleaching solution for varying periods, fifteen minutes, one hour, and twenty-four hours, with a minimum possible rating of ten points.

"Fading" was the final subdivision of the test. Each sample was subjected to ultra-violet light for a period of forty-eight hours with a minimum acceptable rating of seventy points. A possible maximum of one hundred twenty points might be obtained for the combined test but a minimum of one hundred points must be obtained. Actually only five of the twenty-five inks attained a record of over one hundred

and of these, one was a carbon ink and would not be considered by the state chemist.

The length, thickness, and width of typewriter ribbons were measured to indicate which ribbon contained most value in proportion to its cost. The "Character of Ribbon" (thread count, evenness of edge, and imperfections) has much to do with the quality of the work produced. The "Character of Writing" (basic color, oiliness, smudging, and typefilling) determines whether or not the ribbon will produce an evenness of writing and one which will force into the paper a sufficient quantity of ink to make a suitable permanent record. The "Life of Ribbon," which includes a wear-down and recovery test, indicates the amount of time the operator can safely continue to use the ribbon for record purposes. "Fading" is tested by a similar procedure used in the ink test, and the importance of this part of the test is indicated by the fact that our standard, which has a total of one hundred points, allots sixty of these to fading qualities in the ribbon. To pass the Connecticut test, ribbons must attain a minimum of eighty-five points. Of the fifty-five ribbons tested, thirty-nine were approved. In both the ink and the ribbon tests, standards of the National Bureau of Standards were followed to a large extent. However, additional tests were added as required by Connecticut's state regulation.

The permanence of ink has been a very important factor in the preservation of records in Connecticut in a number of instances. During the flood and hurricane of September 21, 1938, the value of a good record ink was shown by the following experience. Memory of the incident will always be helpful in the enforcement of our law. In one of our probate districts the records were housed in a safe, located in a small office building near a brook which was close to a mill pond. When the hurricane was reported, the record volumes and files were hurriedly transferred to the town vault. In the excitement, the card index was neglected. Several dams in the back country failed and a flood which swelled the brook to river size floated the probate office away from the foundation and deposited it in the mill pond. An oil heater, which was burning at the time, exploded, split the building apart and deposited the index in the mud at the bottom of the pond. Three days later, after the water had subsided, the index was found. The cards were washed and dried, and the records, while not as good as new, were readable and therefore still useable.

Modern record paper, with its exact chemical and fiber content determined to the *n*th degree, is a far cry from the bark, papyrus, skin, or parchment which was used in the earliest era of writing. In 1639, the General Court of Massachusetts Bay Colony passed an act which read as follows: "It is therefore by this Court ordered & decreed that henceforward every iudgment, wth all the evidence, bee recorded in a booke to bee kept to posterity." Later, in 1816, the necessity for a very definite type of paper was recognized and the following law was passed by the legislature of that same state: "All matters which are to be entered of record in any office of Public Record . . . shall be so entered or recorded on paper made wholly of linen, of firm texture, well glazed and well finished." Nearly one hundred years later, Connecticut placed on its law books the following: "No person having custody of any book of record or registry in any department or office of the state or of any county, city, town, borough, or probate district shall use or permit to be used for recording purposes any book which shall not be composed wholly of a standard millbrand paper with dated watermark approved by the Examiner of Public Records." This law has remained substantially the same except for the addition of a penalty of one hundred dollars fine for failure to obey. This penalty also may be imposed for the failure to use an approved ink.

The paper test is subdivided into several tests. "Chemical Characteristics," noting fiber, acidity, rosin and glue content, may be mentioned first. The stability of the sample is also tested for alpha cellulose content and copper number after seventy-two hours at one hundred degrees centigrade. Only one hundred per cent white rag stock may be used and the paper may contain not less than a minimum of five per cent acid; one and five-tenths per cent glue and ninety per cent minimum alpha cellulose; one per cent maximum of rosin and one per cent maximum copper number. The "Physical Characteristics" include folding endurance and bursting strength tests which vary according to the weight of the paper tested. The "Writing Characteristics" include ruling, writing, and erasure—the first two must be clean cut without spreading and show a suitable degree of penetration, while the third, erasure, must leave a suitable surface which will absorb a proper amount of ink without spreading and still retain a satisfactory surface. The paper test also follows United States Bureau of Standards. In addition to these forms, we expect,

in a test to be made this fall, to use a tearing test necessitated by the fact that at present many of the official record volumes are of the locking loose-leaf binder type.

It will be noted that papers are tested on a basis different from inks in that maximum plus minimum requirements are offered in the case of inks or typewriter ribbons, while the paper standard provides that if the sample fails in any one of the subdivisions indicated, that paper may not be approved.

The building of a record paper requires constant vigilance. For not only is it necessary to overcome ordinary aging and ink hazards, but this product must be able to resist effectively the acids which are formed by the combination of perspiration and hand lotions used by most workers in record offices where contact with the records is practically continuous.

The record official of today is usually of the highest type and through the years has developed great pride in his records with more than ordinary concern that suitable inks and permanent papers should be provided for their continuance. It is not enough to have good ink, ribbons, and paper, but in addition, suitable protection against fire is quite as essential. The state of Connecticut, through its legislature, passed a law in 1939 requiring that all public records be housed in suitable fireproof safes, vaults, or buildings. Failure to comply makes it necessary for delinquent officials to appear before the State Library Committee, which has general supervision of the records in the state. After a hearing, this committee may order the examiner of public records to purchase suitable equipment at the expense of the town or other responsible agency. This law became effective July 1, 1939. Since then, ten new vaults have been built and twenty-three are in process of construction. Twenty-seven insulated vault doors have been installed and bids have been submitted for one hundred and seven. Forty-five *A* or *B* label safes have been purchased and bids for sixty-six others are being considered. Persons having intimate knowledge regarding such matters have indicated to us that as a result of this law, Connecticut records, within the next few months, will be among those best protected in the New England states.

HAROLD S. BURT

Examiner of Public Records
Connecticut State Library