treated in like manner. In the chemical analyses of these tissues, a modification of the Robinson, Williams, Dudley and Byer[3, 4] method of determining selenium was used. Blank tests were run on all reagents. (See Table 1.)

TABLE 1
LIVER ANALYSES

No.	Species	Dry wt. liver	Ppm selenium
A*1	American pintail	5.197 gms	7
2	" "	4.201	16
3	Common mallard	3.667	19
4	" "	6.776	16
5	" "	4.716	40
6	Green-winged teal	1.669	44
7	" "	1.426	52
8	" "	1.307	76
9	" "	2.311	43
10	White-faced glossy ibis	4.075	25
11	Avocet	2.971	25
B†1	American pintail	3.196	11
2	" "	3.268	18
3	" "	2.065	39
4	" "	3.358	24
5	" "	1.519	40
6	Common mallard	2.369	34
7	Green-winged teal	1.635	148
8	" "	1.629	49
9	" "	2.522	32
10	" "	1.300	92
11	Shoveller	3.105	19
12	American coot	2.434	49
C‡1	Green-winged teal	2.335	none
2	Redhead	5.065	none
3	American pintail	5.380	none
4	" "	4.635	none
5	Common mallard	6.015	10
6	Redhead	5.910	10
7	Common mallard (juv.)	4.545	10
D§1	Common mallard	6.737	none
2	" "	6.091	none
3	" "	12.477	none
4	" "	7.976	none
5	" "	6.537	none
6	Common black duck	7.326	none
7	" " "	8.626	none

* A Samples from Utah Lake (dead ducks).
† B Samples from Lake Front Project, 15 miles northwest of Salt Lake City (dead ducks).
‡ C Samples from supposedly healthy birds collected on shooting grounds near Brigham, Utah, prior to an outbreak.
§ D Samples from healthy birds obtained from Pymatuning Swamp area, Pennsylvania.

A marked decrease in the size and weight of livers was noted in the specimens obtained from waterfowl dying of the duck sickness. This supports the experimental finding that ducks, which were poisoned on low concentrations of selenium as sodium selenite (up to 18 ppm.), fed in the drinking water, showed a reduction in the size and weight of the livers. The experimental birds also showed all the symptoms of western duck sickness in successive stages. Higher concentrations of selenium produced death within ten to twenty-four hours, and the birds died without perceptible shrinkage of livers.

Vegetation, including *Potamogeton pectinatus, Salicornia rubra, Chara* and *Ruppia maritima,* taken from Willard Spur and Unit 3 of the Great Bear Marsh area on August 29, 1939, showed no evidence for the presence of selenium. Soil and water samples taken from the same places contained no selenium.

Although large numbers of birds die during major outbreaks of duck sickness, they represent but a small percentage of the actual birds present in the areas.

The waterfowl poisoned with selenium probably ingest it in either an organic or inorganic form from small, restricted areas.

These results would indicate that selenium is a factor in western duck sickness.

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SCIENTIFIC APPARATUS AND LABORATORY METHODS

A SIMPLE METHOD FOR THE FILING OF MICROFILM RECORDS IN SHORT LENGTH STRIPS

RECENTLY L. R. Dice[1] described a simple method of filing microfilm records. For the past three years, we have employed a different method which we believe has advantages commending its description. We have found the method applicable to an industrial laboratory library, a school library and to private libraries.

Much attention has been given to the filing of 25-, 50- and 100-foot lengths of microfilm copies of documentary material. Little attention has been given to lengths of film of not over 3 feet, and often under 18 inches in length. As it is customary to photograph 16 pages of the ordinary magazine, journal or similar material on a 1-foot length of 35-millimeter film, it often happens, particularly in the fields of science, that an entire article can be copied on one foot or less of film. We have found it more convenient to use such copies in their short-strip form rather than splice them together into long film lengths.

The film strips are conveniently stored in an ordinary 10 × 12-inch filing cabinet drawer by making use of specially prepared filing cards of this size. These cards are prepared by taking a 10 × 12-inch piece of 1/16-inch cardboard and sewing onto one or both surfaces of the card layers of cloth, so that pockets are formed. A convenient type of card, which we have employed extensively, consists of four pieces of cloth sewn on one side of the cardboard. This results in six rows of three pockets each or a total of eighteen pockets. Each pocket is capable of holding a one-foot film strip, or 16 pages; thus, on one card, it is possible to file 288 pages of microfilm copies of documentary material.

[1] SCIENCE, 89: 39–40, 1939.

[3] Robinson, *et al., Ind. Eng. Chem. Anal. Ed.,* 6: 274, 1934.

[4] *South Dakota Exp. Sta. Bull.,* No. 311, 1937.

We have used many different cloths in preparing these cards. If no attention is paid to the expense, a most excellent material is tracing cloth. However, we have found equally suitable and much cheaper ordinary book-binding fabrics. Another inexpensive material which we have used successfully is oiled silk. We have noted no injury to our films as a result of the use of the latter material. Any cloth which does not ravel along its cut edges and presents a smooth, non-scratching surface can be used. In sewing the cloth to the board, care must be taken that it is not pulled tight across the board but rather caused to cup slightly between rows of stitching to provide space for the insertion of the film strips. This may be accomplished by putting a small piece of cardboard, slightly greater in thickness than the film strips, underneath all the pieces of cloth when sewing the material to the cardboard. In order to have pockets accommodating 16 pages, the seams are run lengthwise of the card. In some cases, it is convenient to prepare cards to hold shorter strips, running the seams crosswise. It is also advantageous to indent each successive cloth layer one quarter of an inch further from the right-hand edge of the card than the cloth layer immediately beneath it. This affords easy access to the various pockets in a given row and reduces the number of pages which can be stored in the top pocket of a three-pocket card by only one page. Each pocket is 40 millimeters wide, thus giving ample clearance for the 35-millimeter film.

In filing the film, it is convenient to record the identifying data concerning the film and the source of the material which has been copied on a strip of gummed paper which can be pasted onto the cloth surface. There is ample room on the top surface of each row of pockets to record full information concerning each of the three films filed in the three pockets beneath. The films themselves may be given identifying numbers or notches on the leader of the film indicating pocket and card numbers, readily facilitating the return of the film to the card and pocket in which it belongs.

The use of such a system of cards makes possible the assembling of material pertaining to a given topic from widely divergent sources. On the other hand, we have used the cards as a means of assembling copies of several items from the same volume of a journal. The system is quite flexible and, as peculiar needs for variation in the filing scheme arise, can readily be adjusted to meet the immediate needs. For libraries, the issuance of an entire film card to the patrons can at least partially combat the drawback of the inability to scan shelf titles in a library of film, since the scanning of related titles on the card may serve to suggest further readings of interest.

Another use which we have made of these filing cards is to file copies of complete books and volumes of bound magazines in short strip lengths rather than in long reels. An advantage which we have found in this procedure is that, particularly in the case of reference works, it is more convenient to examine a short strip length containing the desired page rather than going through the majority of a 50- or 100-page reel to obtain a desired page reference. One other advantage of this scheme is that more than one person may make use of a book at the same time, provided that they wish to consult different pages. It is particularly convenient to file indices in this fashion.

The majority of books which are copied on microfilm do not exceed 550 pages. It will be noted that it is possible to file such a book on two cards prepared as described above to hold 288 pages each. However, if 18 pockets are prepared on each side of the cardboard, the entire book may be filed on one card. Probably most material on film lengths of 25 feet or more can best be filed in roll form. But it has been our experience in acquiring research material on microfilm during the last five years that a large majority of the items which we have required in connection with chemical research have been articles of 16 pages or less. Frequently the items do not exceed five pages.

We have found that this method of filing enables us to put a maximum number of films into a given space when short film lengths are involved. Thus it is possible to file, in a 28-inch filing drawer, 65,000 pages of material. If cloth is sewn on both sides of the cardboard and if more numerous pockets seem advisable, this number may be increased. Certainly such a system of filing makes possible the assembling of the research material required by individuals and small industrial research laboratories in an ordinary 4-drawer filing case.

A catalogue notation on 3×5-inch filing cards recording, in addition to the ordinary information found on library catalogue cards, the file card and pocket number in which the film is kept serves to locate the film. We have found an author and a journal listing of items received useful.

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BOOKS RECEIVED

BENNETT, H., Editor. *The Chemical Formulary.* Vol. IV. Pp. 638. Chemical Publishing Co. of N. Y. $6.00.

National Resources Committee. *Consumer Expenditures in the United States; Estimates for 1935–36.* Pp. iii + 195. Illustrated. Superintendent of Documents, Washington. $0.50.

SEDGWICK, W. T. and H. W. TYLER. *A Short History of Science.* Revised by H. W. TYLER and R. P. BIGELOW. Pp. xxi + 512. 61 figures. Macmillan. $3.75.

SOKOLNIKOFF, IVAN S. *Advanced Calculus.* Pp. v + 446. McGraw-Hill. $4.00.