nitrogen observed in the variety of hydrolysates examined, whether from benign or malignant[6] tumors, normal tissues or proteins (Column 6), shows that malignancy is, *as a generality,* not specifically characterized by the presence of amino acids of unnatural (*d*-) configuration. Whatever interest certain of Kögl's data may retain for general biochemistry, the main contention concerning malignancy specificity is, for the cancer field, evidently no longer tenable.

Further experimental details and discussion of our work will be forthcoming, together with accompanying data on glutamic acid isolations from some of the more interesting hydrolysates. Following the suggestion of Professor du Vigneaud, most of the hydrolyses were carried out in HCl containing heavy water, and experiments to determine the content of deuterium attached to the *alpha* carbon atom will be performed with any *d*-glutamic acid found. It is hoped that this procedure will provide a critical decision as to whether such glutamic acid as may occur partially racemized in the hydrolysates had been formed during the process of hydrolysis.

We are deeply indebted to Dr. C. P. Rhoads, Dr. Fred Stewart, Dr. Frank Foote, Dr. Ruth Snyder and Dr. John Pool, of Memorial Hospital, for large numbers of tumors and tissues identified and kindly placed at our disposal by them; likewise to Dr. Jacob Furth, of the Department of Pathology, Cornell University Medical College and New York Hospital; to Miss Betty Robinson for technical assistance; to the National Advisory Cancer Council, the Jane Coffin Childs Memorial Fund, and the Ella Sachs Plotz Foundation for grants; and, finally, to Professor Vincent du Vigneaud for his counsel.

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[6] The rather higher value for sample X (3.7 per cent. *d*-N) was not obtained with the other primary breast carcinoma of even more advanced malignancy (sample K, 1.2 per cent. *d*-N).

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SCIENTIFIC APPARATUS AND LABORATORY METHODS

A SIMPLE METHOD TO USE IN RECOVERING FECES AT MEASURED INTERVALS

IT is often necessary to collect fecal droppings from test animals at given intervals, and to do this by means of a simple, inexpensive and yet accurate mechanism would facilitate the handling of many physiological problems. This is especially desirable where constant attendance is not possible and a continuous record is desired. Such is the case when measuring the time at which poisons are eliminated from an animal body.

The method, as outlined below, was used to accurately determine the larval life history of *Pieris rapae* (Lepidoptera), and could be used in toxicological investigations on many leaf-feeding insect larvae.

By connecting the hour-hand mechanism of a clock to a thin aluminum disk (a phonograph record may be equally well used, depending upon the chemical requirements desired) supported on a bearing so as to rotate freely, the disk will revolve once in every twelve hours. An insect feeding upon a small leaf suspended above the moving circular sheet will leave, by means of the excrement dropped, a record of its activities. If ingested poisons caused the insect to fall, it would remain on the record as its own marker of the time of collapse. With *Pieris rapae,* the insect fed on a rooted cabbage leaf suspended in a constant temperature compartment over the disk which provided an adequate time-recording mechanism and left its whole history in the form of pellets and cast skins.

Numerous adaptations may be applied. With caged animals such as mice, a funnel placed under wire-floored cages can direct excreta to a series of pockets on the circular sheet, and with a series of removable disks a semi-permanent record is obtained which may later be analyzed. A record of the number of caterpillar pellets may be plotted with time as the abscissa and number of pellets as the ordinate, and the life history with molts can be timed with far less experimental error than is introduced by normal variation. Should it be desirable to run more than twelve hours without attention, a large disk can be used and the speed geared down; or, as was done in one instance, the source of pellets was shifted into another circle by means of an electrical circuit being completed by contact to a point on the disk, so as to act through a relay.

In insects at least, the amount of excreta is proportional to the feeding and may be used to investigate the effect of factors such as light, temperature, humidity, repellents, etc., on the feeding rate. With *Pieris rapae* it was found that (1) the number of pellets excreted, if grouped in hour or two-hour intervals, will show pronounced fluctuations, there being periods of greater or lesser feeding. (2) The length of the non-feeding periods during ecdysis one through four were successively 9, 16, 17 and 29 hours. (3) The feeding gradually builds up to a maximum in each instar and then abruptly ceases in preparation for the molt. (4)

There is an increase in the size and number of pellets with each instar until in the last there is evidence of extremely voracious feeding. The duration of the feeding part of each stage was 30, 50, 60, 70 and 80 hours.

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INDEXING AND FILING SCIENTIFIC PHOTOGRAPHS

RECENTLY the author has had occasion to consider at some length the problem of indexing and filing geological photographs. Inquiry among photographers and professional colleagues has revealed that there is a wide variety of possible systems and that in a surprisingly large number of instances the collections are characterized by little or no system. In the field sciences, particularly geology and geography, some system of filing photographs is absolutely essential. This has been very forcibly brought home here at the University of Maine. The geology department recently received the gift of a considerable number of photographs and negatives of a geologist who died suddenly. Unfortunately, negatives and prints were separate and many of each lost. Localities were impossible to identify except in the few cases where there was a notation on the back of the print, or were identified by personal recognition. The value of the collection, hence, is only a fraction of what it might have been otherwise.

Some photographers use albums for the preservation of prints with sections devoted to various aspects of subject-matter. Negatives of such prints are easily lost or confused. Some use a continuous number system, the individual pictures being numbered in order of acquisition. No mineralogist would think of arranging a mineral collection in any such order, and a photographic collection so indexed or numbered is equally confused.

The following system has been devised here at the University of Maine for our geology collection. Although at present the collection is small, it is planned as the nucleus of a continually growing collection, and the system is elastic enough to take care of any expansion. Our system is, in brief: Prints are mounted on the face of a four-by-six envelope. On the back of each print and envelope is written the exact locality and date, a number and such other data as may be desirable. The proper number is also printed in the upper left-hand corner of the face of the envelope; if a lantern slide of the photograph has been made the number is printed in red, otherwise in black. The corresponding number is also inked onto the negative, and the negative placed in the envelope. Index tabs between the various major divisions are placed in the file, so that the photographs are naturally grouped.

The numbering system used is a decimal system. An example of our practice follows: One of our pictures has the number 8.11–3. The "8" at the left of the decimal indicates glacial work; the first figure "1" at the right of the decimal indicates erosion; the second "1" indicates striae and polished surface; the last figure, "3," indicates that this is the third of such photographs on file. Another of our pictures is 4.112–5. The figure "4" at the left of the decimal point indicates streams; the first figure "1" at the right of the decimal point indicates erosion; the second "1" at the right of the decimal point indicates the stream is in the youthful stage of the erosion cycle; the third figure at the right of the decimal point indicates potholes; the fourth figure individualizes that particular photograph. A supplementary card index may also be of value.

The system can be modified in a number of ways to meet varying requirements. Special collections may be headed by other figures at the left of the decimal. (The figures we are using at the left of the decimal in our general collection correspond to the chapter numbers of a very widely used introductory text-book of geology—but this is merely for convenience in assigning the picture to the general group.)

It is hoped that this note may be of some value, in a suggestive way, to the apparently considerable number who have no very satisfactory way at present of filing and indexing photographs. No claim is made for the originality of this system. Possibly similar systems may be in vogue in many individual instances, although such have not come to the writer's attention.

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BOOKS RECEIVED

HAMILTON, W. J., JR. *American Mammals.* Pp. xii + 434. 92 figures. McGraw-Hill. $3.75.

HIRSCHLAFF, E. *Fluorescence and Phosphorescence.* Pp. vi + 130. 42 figures. Chemical Publishing Co. $1.50.

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