5-hydroxyindole compounds examined (Table 1) fluoresce with sufficient intensity that 0.1 to 0.4 μg/ml can be measured. This sensitivity has made it possible to develop a fluorimetric procedure, described elsewhere (*3*), for the determination of 5-hydroxytryptamine in blood. This compound is found in human blood to the extent of about 0.1 to 0.2 μg/ml.

Fluorescence evoked by ultraviolet radiation below 365 mμ is not peculiar to the indole compounds but occurs with a large number of organic compounds. The results of a preliminary survey of organic compounds that show both visible and ultraviolet fluorescence are presented in Table 1.

The instrument described is intended only to provide information about the utility and design of a spectrophotofluorometer. A more practical form of this instrument is currently being designed.

ROBERT L. BOWMAN
PATRICIA A. CAULFIELD
SIDNEY UDENFRIEND
Laboratories of Technical Development and Chemical Pharmacology, National Heart Institute, Bethesda, Maryland

References and Notes

1. We wish to express our appreciation to Bernard B. Brodie, who was instrumental in getting this study under way.
2. 5-Hydroxytryptamine was made available by Abbott Laboratories and Upjohn Laboratories as the creatinine sulfate complex. 5-Hydroxytryptophan and 5-hydroxyindoleacetic acid were synthesized by A. Ek and B. Witkop. The other indole compounds were commercial samples that were shown to be chromatographically pure.
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Priority for Reporting of Scientific Discoveries

Many problems concerning priority for the reporting of scientific discoveries are symptomatic of the fierce competition that often underlies the professional relationships among scientists. Although it can be demonstrated, historically speaking, that many scientific discoveries have been announced by several investigators almost simultaneously or within an exceedingly short period of time (*1*), various individual names are associated with these discoveries, even though the work of others may have been of equal magnitude. On the other hand, many scientists do not even bother to give credit to those who hold priority for scientific ideas; and thus they strive to establish an impression that priority for these ideas belongs to themselves (*2*). Much of this behavior, of course, is concerned with the general emotional problems of scientists in a world where competition for prestige is perhaps even more important than competition for monetary gain (*3*).

From the practical standpoint, nevertheless, the remarks of Lillie (*4*) on the subject of spurious publication dates are of considerable importance. This is especially true in the field of systematics, where priority establishes the name of a new species, genus, and so forth, and thus avoids the chaos that would otherwise result.

With regard to the general question of priority that was discussed by Lillie, we agree that the actual publication date should be clearly defined with regard to priority. As an example, according to the *International Rules of Zoological Nomenclature* the date of publication is the date on which the publication was mailed or placed on sale (*5*). It appears to us that the actual date of mailing (or sale) of the journal issue is a logical basis for appraising priority because it represents the shortest period in time between unavailability of scientific papers and the moment when they begin to exert "influence on the progress of research in other institutions" (*4*).

Lillie also suggests that journals print the date of receipt of a paper, but he does not seem to clarify the reasons for this proposal. Many journals do indicate the dates of receipt, but, as Lillie suggests, these dates generally are ignored. It appears to us that the date of acceptance of a paper has more value than the date of receipt. In some cases these two dates occur close together, but in many others a considerable period intervenes between receipt and acceptance, which may be preceded by several revisions. The date of acceptance might well be considered as the major basis for appraising priority because it constitutes the final act in the chain of scientific "cerebration, instrumentation, manipulation, and interpretation" (*6*).

The problem of assigning priority to a paper published in a journal dated in the year just preceding the year of actual mailing would probably be solved if all journals showed both the actual mailing dates on the particular issues and the dates of acceptance on the particular papers. The date of acceptance would also prevent the assignment of priority to paid papers, which are usually published in the next issue of the journal. A prominent American journal states in its notice to contributors that "accepted papers which raise no questions of scientific priority may however secure earlier publication . . ." if the cost of publication is paid. The danger of this policy lies in the fact that the editorial board cannot know whether a question of priority exists except with regard to its own journal. Thus the date of acceptance becomes vital, for a paid paper may announce a discovery a year or more prior to publication of a similar finding that was in press when the paid paper was accepted. This might discourage rapid publication of paid papers written by unscrupulous or emotionally insecure scientists who have gleaned material either from manuscripts in preparation by colleagues or from those, written by colleagues, that are already in press.

In summary, we propose that journals show both the actual date of mailing of the journal and the date of acceptance of the paper as the basis for priority. Furthermore, these dates should also appear on reprints or tear sheets for distribution by authors. Finally, editors might well require authors to include the mailing date of a journal in bibliographic citations.

LEO KARTMAN
HAROLD E. STARK
Communicable Disease Center, U.S. Public Health Service, San Francisco Field Station, San Francisco, California

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14 January 1955

Physical and Chemical Factors in Relation to Histoplasma capsulatum in Soil

The geographic variation in the prevalence of histoplasmin sensitivity is an established epidemiologic fact, but the basis for this phenomenon remains unknown. Undoubtedly the variation results in part from factors that influence the occurrence and distribution of the sensitizing agent, *Histoplasma capsulatum*, in the environment.

The primary source of *H. capsulatum* is believed by most investigators to be soil, but the fungus is not found in all soils. Even within an area of high prevalence of histoplasmin sensitivity such as Williamson County, Tenn., *H. capsulatum* has been isolated with significantly greater frequency from some soils than it has from others (*1, 2*). Studies have demonstrated that the fungus is cultured predominantly from soils in places frequented by chickens, although chickens are not a reservoir of histoplasmosis. It is logical to assume that qualitative or quantitative variations in the chemical components or physical characteristics of different soil specimens may be at

least partially responsible for the presence of the fungus in one sample and its absence in another. It was in an effort to discover any such determining factors that the study reported here was undertaken (*3*).

Mycological studies of soil from Williamson County have been conducted on a survey basis in the past with soil samples collected at random from all parts of the county and from a variety of sources (*1, 2*). In the present investigation it was desired to obtain as high a yield of isolations of *H. capsulatum* as possible. Therefore, most of the soil samples were collected from sites where the fungus had been found previously, and from sources known to harbor the fungus most commonly, such as chicken houses and chicken yards. Thus, a little more than half of the specimens (54 of 100) were obtained from the latter sources, but 46 samples were collected from less likely habitats in order to provide material for comparison.

Soil samples were collected by scraping the top 0.5- to 1-in. layer of soil into a clean, previously unused, wax-lined paper carton of 1-pt capacity. The sample was assigned a number, and a record was kept of the source from which it had been obtained. After the sample had been thoroughly mixed to make it as homogeneous as possible, aliquots were sent to the mycology unit of the Communicable Disease Center in Chamblee, Ga., and to the Georgia Agricultural Experiment Station at Experiment, for mycological and physical-chemical study, respectively. In order to avoid the introduction of bias, neither laboratory was advised of the source of the sample or the results of the other's analysis until all studies had been completed.

The method used for the isolation of *H. capsulatum* from soil has been described previously (*2*). The moisture-holding capacity of the various soil samples and the percentage of clay in them were determined by the methods of Bouyoucos (*4*), with modifications. The methods of Olson (*5*) were used for the analyses of NO_3, P_2O_5, K_2O, CaO, and MgO. Loss on ignition was determined by the procedure recommended by the Association of Official Agricultural Chemists (*6*).

Table 1. Results of mycological examination of 100 selected soil samples by source of sample, Williamson County, Tenn., August 1953.

Samples		*H. capsulatum* isolated	
Source	(No.)	(No.)	(%)
All sources	100	27	27.0
Chicken house	39	18	46.2
Chicken yard	15	3	20.0
Under or near dwelling	38	6	15.8
Other	8	0	

Table 2. Mean values of various physical attributes and chemical components of 100 samples of soil, by source of sample and by presence or absence of *H. capsulatum*, Williamson County, Tenn., August 1953. Values for NO_3, P_2O_5, K_2O, CaO, and MgO are in pounds per acre available; values for loss on ignition, moisture-holding capacity, and clay are percentages.

Test	Normal average medium value	All soils		Chicken house and yard soils		Other soils	
		Pos.	Neg.	Pos.	Neg.	Pos.	Neg.
*p*H		6.2	6.6	6.2	6.6	6.0	6.5
NO_3	15– 30	59.3	51.9	59.3	58.9	59.2	46.6
P_2O_5	100– 150	446.0	461.3	432.0	467.7	500.0	456.3
K_2O	150– 250	539.1	548.8	562.5	614.0	461.2	495.9
CaO	400–1000	2937.9	2881.7	2930.4	2896.8	2966.7	2870.0
MgO	40– 100	182.8	175.7	180.4	176.6	191.7	175.0
Loss on ignition	5– 7	19.4	17.4	21.5	22.3	11.2	13.6
Moisture-holding capacity	20– 30	35.1	34.0	38.9	40.1	31.3	32.2
Clay	15	15.3	19.0	15.4	19.3	15.3	18.9

Histoplasma capsulatum was isolated from 27 of 100 soil samples (Table 1). By far the greatest proportionate yield of the fungus was obtained from specimens collected inside chicken houses, chicken yards, and under dwellings where chickens had congregated. These findings were consistent with the results of previous studies (*1, 2*).

The physical and chemical analyses are correlated with the mycological findings in Table 2. The values for most of the attributes studied were so uniformly high that small differences became meaningless. The most noteworthy finding was the observation that soils from which *H. capsulatum* had been isolated had an appreciably higher acidity than negative soils. In addition, it was noted that among positive soils, those that had been obtained from chicken houses and yards had a significantly higher organic carbon content and moisture-holding capacity than positive soils from other sources. These observations are not unexpected, of course, for soils associated with chickens are heavily contaminated with manure and thus are rich in organic matter, and the high humus content of the soil tends to increase its capacity to hold moisture.

The higher acidity observed in soils positive for *H. capsulatum* suggests that the *p*H may be an important factor in determining whether a particular specimen of soil would make a good or poor habitat for the fungus. In the laboratory *H. capsulatum* is capable of abundant growth over a wide range of *p*H. Under natural conditions, however, when the fungus is competing for survival with myriads of other microorganisms in the soil, the level of *p*H may be more vital. It is possible that acid soil may act by inhibiting certain competitors, rather than by enhancing the growth of the fungus directly. It may be worthy of note that, in areas of highest prevalence of histoplasmin sensitivity, the soil is characteristically acid (*7*).

Although the results of these studies do not explain either why there is a geographic variation in the prevalence of histoplasmin sensitivity or the association of *H. capsulatum* in soil with chicken habitats, it is hoped that they will stimulate further investigations.

L. D. ZEIDBERG
Tennessee Department of Public Health, Franklin

LIBERO AJELLO
Communicable Disease Center, U.S. Public Health Service, Atlanta, Georgia

R. H. WEBSTER
Georgia Agricultural Experiment Station, Experiment

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21 April 1955