the original unchromatographed extract. Not all the subjects were tested with all the fractions. Results of 2 typical cases are given in Table 2.

The nitrogen content of the weakest dilution causing a reaction in each subject was determined for each fraction and the original extract. It was seen that in many instances some fractions gave reactions when the unchromatographed extract containing an equal or larger amount of nitrogen did not. This was especially true of Fractions 2, 3, and 4.

We are at present subjecting this material to more extended chemical investigation, electrophoresis, and other immunological studies. We also intend to place a group of ragweed patients upon treatment with it, observing the clinical results, its absorption, and incidence of reactions, as compared with ordinary ragweed extracts. We are extending this work to food, dust, mold, and other allergens. By decreasing the incidence of false positive reactions and by increasing the potency of our testing materials, it is felt that the reliability of skin testing in the diagnosis of allergy will be tremendously increased.

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The Mg Content of Various Nucleic Acid Compounds

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Since they can readily be disaggregated by minimal quantities of salts (*1, 2*), a number of polynucleotide bonds can be assumed to be essentially of electrovalent type. In experiments made to determine whether metals were active in this connection, it was found that Mg was present in a relatively high concentration. On the other hand, closely related metals such as Ca and Zn were not present to any marked extent. Traces of Sn and Pb were found, but these metals appeared to be loosely bound and were presumably impurities.

The Mg content varied within fairly narrow limits, and an order of magnitude, that was to some extent characteristic, was found within each group of substances studied. There appears to be some correlation with the degree of polymerization, although the Mg content seems to be more dependent on the mildness of the preparative procedure used. The Mg content can be decreased by dialysis. This is presumably caused by hydrolysis, and this is facilitated by other salts that expel Mg. On longer treatment—for example, with strong NaCl solutions—the Mg content decreases appreciably, but is only freed altogether after treatment with acid. It is therefore understandable that preparations exposed to stronger reagents do not show the same high concentration of Mg.

TABLE 1

Material	Preparation according to	Mg content Spectroscopically estimated order of magnitude (%)
Sodium thymonucleate from calf thymus	Hammarsten (1924)	0.01–0.1
	Hammarsten (1924)	~ 0.1
	Gulland *et al.* (1947)	~ 0.1
	Gulland *et al.* (1947)	~ 0.1
Nucleohistone from calf thymus	Carter and Hall (1940)	0.1–1
	Carter and Hall (1940)	0.1–1
	Carter and Hall (1940)	~ 1
Thymus from calf	(Lipid-freed by treatment with alcohol-acetone)	0.1–1
Ribose nucleic acid from yeast	Johnson and Harkins (1929)	~ 1
	Levene and La Forge (1910)	> 1
(Commercial preparations)	Merck	~ 1
	May and Baker	~ 0.1
	Lemke	~ 0.1

Table 1 shows a survey of the results of spectroscopical studies (for which the writer wishes to thank S. Landergren, of the Geological Survey of Sweden).

Chemical analysis offers considerable difficulty because of the large amount of disturbing alkaline phosphates after combustion. We have tried wet and dry combustion, followed by precipitation as $Mg(NH_4)PO_4$ or $MgCO_3$, but with poor reproducibility. By spot tests (Titian yellow and others) after mild acid hydrolysis, Mg is easily detectable.

The Mg content of sodium thymonucleate is of interest in view of the Mg activation of desoxyribonuclease, but also for other enzymes with a possibly analogous mechanism. As have similar ions (i.e., Ca^{++}), Mg^{++} has evidenced certain special effects on sodium thymonucleate in the way of gelation, hydrolysis, etc., as found by Hammarsten (*3*). An aggregate weight many times higher than normal is found on precipitation of sodium thymonucleate in the presence of Mg^{++} with ethanol (*4*).

No such distinct effects of divalent ions are found in the case of polyribose nucleotide from yeast in which Mg (*5*), as well as Cu and Ca, (*6*) has been found. Many signs of the importance of Mg in processes possibly connected with the metabolism of nucleic acid have, however, been observed (e.g., works by Fulmer *et al.* [*7*]).

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Sound Recording and the Problem of Evidence in Psychiatry[1]

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Recording the verbal behavior of patients. Research workers in the field of psychodynamics have long been in the paradoxical situation of having their most productive source of data, the psychiatric interview, closed to the scrutiny of independent observers. Much of the research and instruction in the field of psychotherapy has thus depended on hearsay. In order to subject the patient-therapist relationship and the verbal and other behavior involved therein to study, psychotherapists have resorted to note-taking. Freud (*1*), who noted that the presence of a third party may distort to a significant degree the productions and behavior of patient and physician, made his records retrospectively at the end of a working day. Some workers have followed this lead. Others take occasional notes during the course of an interview, recording a key word or phrase and using it later as a stimulus for further elaboration. Such elaboration generally takes place a long time after the original notes were jotted down. Still others take profuse "verbatim" notes throughout each session.

These methods are subject to a number of criticisms. They depend on the author's memory, and the records may contain significant omissions and distortions. Kubie (*2*) draws attention to the impossibility of retaining by unaided memory an adequate record of the course of treatment. Even the most proficient note-taker misses critical material, and attention to the note-taking process inevitably detracts from attention to the interview situation itself and from the aim of the interview, diagnostic or therapeutic. This not only contributes to omissions, but is one source of actual distortion of data, inasmuch as the behavior and attention of the psychiatrist influence the productions of the patient.

Not so obvious, but perhaps more important in the recording of psychiatric interview data, is the influence of conscious and unconscious screening in the therapist himself. The incoming sensory material often is neither adequately nor completely recorded. The authors found by comparing memories, notes, and actual transcriptions that important material often was omitted. At times recorded interviews elicited responses of startle and surprise, as though the therapist had not previously been in the actual situation and had not previously heard the patient's and his own verbal productions. Omissions, distortions, elaborations, condensations, and other modifications of the data occur, and these all contribute to the difficulty of evaluating what really happened. These processes are important from the viewpoint of methodology and are being studied further.

Recording the verbal behavior of therapists. Observations of the patient and his productions constitute but one part of the significant data of an interview. Another part should consist of observations of the therapist, how he responds to the patient, and how his behavior provokes activity on the part of the patient. Theoretically, the fully trained and experienced psychotherapist should constantly be able to evaluate his own as well as the patient's psychological status during the course of the interview. This cannot, however, be scientifically confirmed unless another observer can somehow be introduced into the situation. This observer cannot, of course, be directly aware of the unverbalized or unconscious thoughts and feelings of the therapist, but on the basis of observed behavior, augmented by accounts of the therapist's own ideations and rationale of treatment, inferences should be possible (*3*). It should be kept in mind that changes of the interviewer's status from participant to observer alter the context of the interview (*4*).

Sound recording as an observational method. As verbal behavior is of paramount importance in psychotherapy, sound recordings permit adequate reproduction of the main features of the process. The method was initially used by Zinn (*6*), F. Deutsch (*7*), Bierer (*8*), and more extensively by Rogers (*9*) and his students. Recently the technique has been perfected to such high standards of fidelity that it has become possible to realize its full potentialities. Minor inflections and nuances, and details of verbal interplay that were formerly missed are now picked up. Unobtrusive though not concealed sound recordings may be obtained in a fashion that need not disturb therapist or patient. Listener strain is reduced to a minimum, and reproduction is of auditorium or broadcast quality (*10*). The data, preserved on tape, may be listened to and analyzed carefully, with opportunity for relistening, by more than one observer. Through the use of recordings the "iron curtain" of the psychotherapist's office, which has so far blocked independent critical inspection, can be lifted.

Direct observation of interviews. As indicated above, inferences about the participants in an interview are based on visual as well as auditory cues. This is one reason why it is important that observers who listen to recordings of interviews be themselves experienced in interviewing. The experienced therapist will not overevaluate auditory cues and underestimate the im-

[1] This work is aided by a grant from the Veterans Administration, VAm23379B.