May 13, 1943

Dear Mrs. —

I thank you very much for that kind letter — of course, I understand why you would make the party to have come to my home. Naturally, they asked it of me that you or other friends outside the A.D.A. must have been invited — it was all to be a surprise — it seemed hard to believe

The very happy if you could have been with us in that evening — we had a little as New Year's Day simply told me that they thought it very about dinner. The first a good deal of the rest — all the "Vanderbilt" of the occasion — that it was a true — — I said I thought it a good idea

and asked whether the men could get together these then very lights — but perhaps it would be better to think and not attempt at noon — I was after much — they painted and this of was good to
have a reason—back up morale—a little
aggression, times like this, were just what we needed.
So the plane went on a time not committed earlier.
And they did come back—McClellan—Koch with
them—Francis Pridham from Yale, Allen from Notre
Dame, Aran from Harvard, Jimmy Francis from Michigan
after. They had reached Belle Place with whom I spent
years at Colgate—but he was sick in bed
with Grippe—sent me a nice letter. Here
was about 35 men present—out of the
400 in attendance. To see the old boys come
back had to make you how they had advanced
not only in years but in their good position.
The boys in the Department wrote from
Tropical froze—All Delco was-master of ceremonies
at theplane-occasion sparkled with Red, White,
and green great humor. Happily, at the time,
looking into regimental and admiral speeches. Bright
Cheerful, happy at this throughout—I really enjoyed it—
May 17th

Last Friday evening I dined with Dr. Gray.

Quotation: "The man attending to Board meeting at Surgeon General's Office in Washington. Erred asked me to have dinner with him. He had a notable character together. He brought message from you. He miscarried my mission plan about the possibility of my coming to Nashville. That I may do as I like to know the depth of understanding with whom it means much to me. The days if this were important on. I felt your poverty to prevent my affairs.

[Handwritten note]

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Regard of 13 days - Letter started again May 26
May 26, 1943.

Almost two weeks have passed since I began this rambling letter. I shall attempt no explanations. I am forced to believe that it has not been wholly due to the meantime to remember fully your conversation. Nicaragua, I have been very much looking forward to your letters and hearing news. Come home each night determined to catch up my letter writing work a hundred or more things change in a month. Turn on the radio and then I go to bed, resolution to get up an hour earlier in the morning. Of course, that makes the present scheme plan.

Here are the home front. I am doing in the Lab. What I write of is because I know you will be interested in this because of our future plans. Have my hands tied to liquidate my affairs here. I expect to spend the rest of my days with my family as I mentioned at the bottom of page 3 of your letter in July. I relinquish Chairmanship of the Department and remove from active membership of the Institute.
to agree with Mr. Rees, have been very kind for having invited me to call on you, to see the problem that I'm
working at — I'm not prepared to go into much detail about it, — indeed, I'm not even sure it is really
worthwhile — because I'm not yet convinced that the results (as yet) sufficiently
support the hypothesis. However, I did write to Ernest about it in Washington, and I hope he will send you — for
I think intended telling you — that I have succeeded in growing directly on my coming eventually
to New York — the problem of the transformation of pneumococcal types. You will recall that Griffith in London,
about 15 years ago, described a technique whereby he could change one pneumococcal type into another pneumococcal type through
an intermediate R form. For example: Type II → R → Type III.

This was accomplished by injecting mice with a large
amount of heat-killed Type III cells together with a small
number of living Type II cells. From Type II, the

posed that had influenced the mice as treated with
from their heart blood he recovered living, encapsulated
Type III pneumonia. They could accomplish only by
the use of mice. He failed to obtain transformation
When the above described mixture was incubated
in broth. Griffith's original observations were
repeated and confirmed both in our Lab and Abroad by
Neal Adams. Then you remember sulfanilamide was
introduced by adding a drop of
anti-R serum to the broth culture. Later Almany used
‘tells extracted prepared from Tissue Cells to
in the absence of formed elements to change from Type III to become
a typical encapsulated in pneumonia. This was
May you remember involved reverse expected transition
in normal broth—after as long as 5-6—before the
change occurred. And in did occur once the
reaction was induced, there often occurred further addition
by the inducing extract, the organisms continued to
produce the Type III Capsules; this in the change was
heredity.
transmissible in many plant and tissues. Temperature for the growth of fungi, from pre-Metabolism to now and to the early
I have been trying to find and name in the chemical nature
of the substance in the vegetable extract which
induces this specific change. The canola extract (green)
is free of Capsular polysaccharide, C (amino) carbohydrate,
and from nucleoprotein, four basic acids of both the
plant and the former type, lipids and other cell constituents.
Try to find in this complex mixture, the action
principal!! Try to isolate and chemically identify
the specific substance that acts by itself. When brought
into contact with the Resinoid, from Type II Cancer
it is elaborated. Type II Capsular polysaccharide, or too
acquire the anti-cancer action of the SAME
specific type as that from which the extract was
prepared.ri
In the heart failure of heart attacks or
heart breaks. And at last perhaps, we have it-
The active substance is not digested by crystalline
trypsin or chymotrypsin. It does not lose activity
When treated with crystalline ribonuclease this specifically break down (Yeast nucleic acid. The type III capsular polysaccharide can be removed by digestion with the specific type III enzyme without lowering transforming activity of a potent extract. This enzyme can be extracted from such extracts by alcohol or ether at -12°C without impairing activity as a lectin. The extract can be de-proteinated by Rever's method (chloroform + n-butyl alcohol) and sent to protein-free at brine. Negatively, the extract, treated + purified to this extent, but still containing traces of protein, lacks of C carbohydrates + nucleic acids of both the yeast + thymus types. This further fractionated by the appropriate addition of absolute ethyl alcohol, an interesting thing occurs. When alcohol reaches a concentration of about 9/10 volume then precipitates out a fibrous substance which on warming the mixture, disperses uniformly about the glass rod like thread on a thread - It has been suggested they be used as granules.
precipitate. The fibrin, made in this way, and the process repeated several times — in short, this substance is highly reactive, as an elementary analysis confirms, very closely to the theoretical value of a pure decarboxylated nucleic acid (thymus type).

The cause has guessed it? This type of nucleic acid has not to my knowledge been recognized in phlegm—cancer syrups—though it has been found in other bacteria—

"Of a number of crude enzyme preparations, from rabbit bone, horse kidney, dog intestinal mucosa, 
+ pneumonia, the fresh blood plasma of human, dog 
+ rabbit, only those containing adenine deeply turn—

capable of breaking down known A.D.N. Authentic 
Samples of decarboxylated nucleic acid have been found 
to destroy the activity of our substance — indirect 
evidence and suggestion that the transforming principle 
as isolated may belong to this class of chemicals.
We have isolated highly purified substance of which as little as 0.02 of a microgram is active in inducing transformation in the Bacteriophage virus (culture medium). This preparation, a dilution of 1 part in a hundred million, reduces plating factor in highly specific. This does not leave much room for improvement, but the evidence is not good enough yet.

In a dilution of 1:1000, the substance is highly viscous, as the nucleic preparation of desoxyribonucleic acid deserts from phages. Preliminary studies with ultra centrifuge indicates a molecular weight of approximately 500,000—a highly purified substance.

We are now planning to prepare new batch for further evidence of purity by homogeneity by use of ultra centrifuge, electrophoresis. This will keep me here for a while longer. If things go well, I hope to go up to Dear Isle, but all this—Come back.
refined with try to pick up some idea of the problem - write up the book. If we can right - ray cause thing not yet proven then it means that nuclear acids are not nearly structurally important but functionally\nacting substance in determining the biochemical activity and specific characteristics of cells. This by means of a linear chemical substance or just compared to make predictable not hereditary changes at all.

This is something that has long been the dream of scientists. The mutations they induced by X-ray radiation always produced random, chance changes. If we prove to be right - out of course that a key if - then it means that both the biochemical medium of inducing them is known and the chemical structure of the substance produced is also known - the former being the same medium and the latter type of segregation, but both are thought to be replicated in the daughter cells, but after innumerable transfers and
Without further addition of the reducing agent, the photo reaction requires the amount of substance to be around 5% in excess. The amount originally used to induce this reaction—Naamda as a base—may be a clue.

But with the chemist, I can find them concerned—

one shaped a Y (Y) is, then na chemistry

of the transformative principle?—Now we else can

work on the metal. Of course, the problem is the metal adds.

Which is known to constitute the major part of chromosomal.

But here, much thought to be able. Regardless of major aspects—

of the proteins, enzymes chemistry, the mechanism

or certainly, rate why where, etc. But today, in later a lot

of true documented evidence to convince anyone that the calcium

salt of hyper reference molecule acid, protein then, could possibly

be induced into such biologically active species.

proverbial. This evidence is our new theory to get

the lake of firm to blow bubbles—by its reason to perform

then yourself before done or else try to...
As there's the ploughing - right or wrong - it's been good for a late of work. This supplemented by my work and general supervision of other important problems in the last has kept the busy, as you can now understand. There it even with your pastime, but don't publish it around - until Mr. Jinks, or at least so much as present the best permits, the important to go to a help bucket - a embarrassing to him to match later.

Wasn't there a pleasant surprise if he hadn't made this very clear - And is worth to learn - I mean you now see that I cannot even been this problem until being far continuing evidence - Then it learns forever - Where they all be caught - Get a the man permitting a line and our days in peace - That a lovely question. Dear Mary and - Her in the - Cart - Work on and all meet in here they - Dear, Mary has kept you all pleased - Though you will not be able to the brass man but Victory must come - The optimistic enough to