In this chapter we wish to consider the nature of the "generic RNA". This is a hypothetical RNA which is supposed to transmute the generic information from the chromosomes to the ribosomes, the sites of protein synthesis in the cytoplasm.

We wish to propose a definite hypothesis about this RNA, which, if true, would lead to an unexpected role for the microsomes.

We shall first briefly review the evidence that a generic RNA of some sort is likely to exist. How we shall describe the role which is often tacitly ascribed to the microsomes. Then we state our hypothesis, and review the experimental results which have lead us to it. Finally we describe some of the implication of the hypothesis and
It is unnecessary to review once again the evidence that gene control determines both gene and protein synthesis, or the evidence that message protein synthesis occurs in cytoplasmic ribosomes. We mention two cases:

1. In mammalian haemoglobin, it is clear that the amino acid sequence is determined by a Mendelian gene. Protein synthesis in cell-free systems made in almost certain that mRNA in the ribosomes restores the translated message.

2. In the β-galactosidase of E. coli, a very good case can be made that its amino acid sequence is controlled by the Z gene. There is suggestive evidence that it is synthesized in ribosomes.

It seems virtually certain, therefore, that "sequence information" must be
conveyed from the gene to the ribosome. We have, however, no
direct evidence against the view that this information is carried by RNA.
We assume it because of the analogy with some RNA, and
prejudice: "the central dogma" (with 1957).
There is evidence, however, from labelling experiments, that some RNA is
synthesised in the nucleolus, then moved into the cytoplasm.

The role of the ribosome.

In all cells, the information for ribosome cannot merely be
entirely of RNA and protein. In E. coli the proportions are 63% : 37%.
Most of the RNA of a cell is in the ribosome. The simplest
hypothesis is that one ribosome makes one type of protein, and that the "template" which
determines the amino acid sequence of this protein is the RNA of the RNA-protein complex of the ribosome. It is this
picture, in its oversimplified form, which we have come to doubt.

A hypothesis about genetic RNA

Our hypothesis is in three parts
1) the major part of the RNA of the ribosome is not genetic RNA,
2) the base-ratio of the genetic RNA closely resembles those of DNA,
3) the genetic RNA is (in some circumstances) irreversible.
This third point will need amplification, but we defer this for the moment.

A review of some experiments.

The first experiments we wish to describe is that of...

... in the vicinity of the region of β-galactosidase where the 2 gene is passed into the F' from the HFR. Without denoting this experiment in detail, we note that the... show that after a minute or so, the activity... to... of the entry of the gene the synthesis of the protein is proceeding at a uniform and very high rate. At this point we note that the experiment was done repeated, it would not have been certain to...

As far is some one, only a few explanations seem at all plausible.

1. The gene in the template (or, alternatively, a single RNA molecule carried in with the gene). This implies an extraordinarily high rate of synthesis since all the molecules of the protein...
gene some 5% of the total protein of the cell is β-galactosidase.

Moreover, such a scheme leaves no sensible role for the microsome, and ignores the evidence already quoted (the β-galactosidase appears to be made in the microsome. Therefore, we have to reject the interpretation.

stable DNA.

The gene makes RNA copies at a high rate, but after one minute a reverse control mechanism operates, to shut off this producer of RNA. This stable RNA is incorporated into ribosomes.

This alternate it cannot be rejected out of hand, but it certainly implausible. A theoretical incursion of simple control mechanism suggest that if the control mechanism is to act quickly it would be difficult to increase the rate of protein synthesis while this is approximately proportional to the number of genes in the cell. In which there is some evidence (?)

3. The gene makes RNA molecules, which go into ribosome, and these make proteins, but these RNA molecules have a life of only a minute or two. This is the hypothesis we have come to favor.
The second experiment, another set of experiment, which too dealt to
mention, to concern the turnover of RNA within the phase-fermented cell
(Turn phase or E. coli) by Wolfkin.

After phase infection protein synthesis proceeds at approximately the same rate
how rather new protein synthesizes cease; here in, however, a turnover of RNA.
The new RNA which appears to have normal base ratios,
which are close to those of phase DNA, and quite different from those of the
share RNA of the uninfected cell. The balance of evidence in favor the lack
(Volkin--)
being a precursor for phase DNA. The RNA appear to
be accurate, though not completely so. The evidence made is difficult to
estimate accurately has appeared to be a few per cent of the RNA of the

It has been shown recently that the

can be found

that their RNA appear in the microsome of the cell, provided they are
isolated in a medium with a high concentration of NaCl (10 Molar).
Our suggestion, then, is that these two RNA's - the hypothetical RNA incorned with β-galactosidase, and the RNA synthesized in the phage-infected cell - are of the same type, 

Yet each has the properties of the DNA. They are both, we assume, generic RNA, and both are (to some extent) variable. Generalizing further we may rationalize that a generic RNA will always follow those of the DNA from which it was copied.

**Explanation for generic RNA.**

*We don't.*

The stability of generic RNA

It is remarkable that we are unable to be precisely how stable generic RNA might be. There are a number of possibilities:

1. The generic RNA might be obligated to break down each time a 
   translated polypeptide chain is synthesized. This would imply an 
   extremely high rate of synthesis for generic RNA in its DNA template.

2. The generic RNA might be broken down obligatorily after being 
   used a certain number of times. For example, it might synthesize protein...
kiln. Their ribosome was full of protein molecules. The rapid release of these, by the stimulation of the 20S ribosome at 50S and 30S complex, might clarify the genetic RNA.

3. The gene RNA might be stable, but a special mechanism might be needed to cleave it in certain cases.

We do not feel that it is correct to dismiss these hypotheses in detail.

At the same time, it is the argument depends on assumptions. Moreover, and then involves a discussion of whether the level to which the gene RNA might be degraded, rather little and knowledge labeling experiment are impossible to improve.

Evidence for genetic RNA:

This is rather anacre. We note that the involvement noted by

between the base ratio of RNA and those of RNA for a group of bacteria finds an easy explanation

along these lines. Better some recent experiment of

might be interpreted in the line, drawn

Some (unpublished) results of Van also fit into their
picture. We find that it is five years a short period of time and isolates (some of) the RNA of the cell that was labelled and injected into the eggs of the same species of yeast DNA.

The same ratio as that of the same transcript of years DNA.

In summary, genetic DNA may be putative evidence partly because it may result in a centella and partly because under high my crystallization rates, it may tend to escape for the release during isolation. For these reasons, we do not feel that the apparent absence is necessarily significant at this stage.

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The New Picture

What surprised us was the new picture on hypotheses, where we observed that for the action of ribosomes. Under our old view and reflected by the action of ribosomes. Under our old view and reflected by the action of ribosomes, ribosomes make the same protein for a short length of time. Ribosomes make the same protein for a long length of time. Since it will probably have received a different molecule of mRNA it will probably have received a different molecule of genetic code for the nucleus. In other words the population of genetic code for the nucleus.
microsomes (at least in bacteriophage T4) is looked on as a machinery into which are fed the genes and which determine which proteins are synthesized. This enable us not need to discuss control mechanism here but it is clear from such a scheme allow the control machinery to operate on the gene level. (See the recent paper by Jacob.)

Thus in phage infection we assume that although all the phage proteins are synthesized in microsomes, there are not new microsomes, but merely those of the infected cell, but now containing gene part for the phage.