homogeneous parent cultures, transplants of such colonies are frequently considered as separate 'strains,'" because its major premise is that the parent cultures are apparently homogeneous. Most bacteriologists use the term "strain" for any independent culture, although various of these cultures or strains might prove to be apparently identical and belong in one "type" or "variety."

When dissociation occurs it may be of two kinds, "phenotypic" or temporary and "genotypic" or permanent. Still another occurrence is that of loss of virulence by pathogenic species in which the cultural and physiological characteristics may remain essentially unchanged. This poses the question: Is there a reliable method for accurately determining when a bacterial culture becomes genetically unrelated to its parent or sister cultures to enable one to designate the progeny as cultures or strains? The reservation of the designation of "strain" for the "offspring of a single 'pure' culture or better still, of a single cell" is a restricted form of definition because it leaves out of account the fact that all cultures are the progeny of single colonies or cells, pure or mixed, even though they are not designated and known as such. Several years ago the writer[2] discussed the pure culture concept in relation to microorganisms, pointing out the range in its interpretation by different investigators. The suggestion that strains "should only be considered as such when it is known that they are genetically unrelated" is an order quite out of reach and keeping with present methods and knowledge.

It is probable that most bacteriologists would be confused by the genetic appellation being considered as basic to the use of the term "strain" in bacteriology. After all is said and done, the terminology all scientists should be striving for is one that describes but does not confuse the scientist or layman of this or some related science. Just as the social sciences are jargon-ridden to their serious detriment, so also are some of the biological sciences cultivating confusion rather than understanding as fads come and go or grow.

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EXPERIMENTAL TUMORS IN AN INSECT

AMONG the conditions which bring about the development of tumors such factors as hormones, nutrition, carcinogenic substances and others are currently studied by many workers in vertebrates, particularly in mammals. This preliminary note concerns an experimental animal not commonly used in tumor research, namely an insect (*Leucophaea maderae*, Orthoptera), and a factor, not usually considered as playing a role in tumorous growth, *i.e.*, innervation.

[2] E. M. Hildebrand, *Bot. Rev.*, 4: 627–664, 1938.

Innervation as a factor in the origin of tumors was studied by cutting the recurrent nerve at various levels. As in other insects this nerve, together with several sympathetic ganglia, represents the stomatogastric nervous system. The branches of the recurrent, which innervate the anterior portion of the alimentary canal as well as the salivary glands and their reservoir, were demonstrated in methylene blue preparations. When the recurrent nerve was cut tumors developed within ten days to several months after the operation in organs innervated by the recurrent nerve, *i.e.*, in the salivary glands, the salivary reservoir and the anterior gut. To date about 250 specimens with experimental tumors were obtained in this way. The tumors which may attain considerable sizes were verified by dissection of the animals, and many of them were cut for histological study.

Histologically the tumors consist of layers of cells which show various degrees of abnormality. In advanced stages the cells near the lumen of the organ, for instance, of the mid-gut, frequently break down into a brownish debris. The anterior portion of the mid-gut is a common site of these tumors. They are also frequently found in the wall of the salivary reservoir where they are particularly conspicuous because normally the wall is a very thin and transparent membrane. In the fore-gut and in the salivary glands well-developed tumors are relatively rare.

Several hundred animals were operated upon in various other ways (allatectomy, castration, etc.), care being taken not to disturb the recurrent nerve. These control operations did not cause the development of tumors. A more detailed report, to be published elsewhere, is in preparation.

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THE SHORTAGE OF SCIENTIFIC PERSONNEL

I HAVE read with great interest the series of discussions and articles in SCIENCE relating to the shortage of trained scientists in this country. As a professional scientist (zoology, general physiology) the matter is of personal concern to me.

However, I have noticed that all the writers, who bewail the future results of the shortage, fail to consider one factor: the large number of highly trained scientists (Ph.D.'s) who are temporarily in the Armed Forces. The vast majority of these are anxious to return to a normal civilian position as soon as possible. They should be carefully considered whenever one discusses the dearth of scientists.

As a first-hand example, may I take my present occupation in aviation physiology with the Army Air Forces? There are well over a hundred aviation