and the adenohypophysis. The neural connexions of the hypothalamus and the limbic system are reviewed by De Groot, but here, and elsewhere in the book, the fact that no agreed or precise function, in the control of endocrine activity, can be ascribed to extra hypothalamic structures indicates where limitations in present techniques leave gaps in our knowledge. A survey of lesion making techniques and a useful listing of stereotaxic brain atlases for different species follow, and bring us to an important chapter on neurosecretion. Bern and Knowles deal extensively with this difficult topic, drawing their examples and their excellent illustrations from many different species. Their definition of a neurosecretory neurone on a functional basis is stimulating and seems likely to provoke much discussion.

A series of reviews of specific topics follows. Two critical but balanced chapters by Sawyer and Mills, and by Cross, deal with the control of secretion of the vasopressin and oxytocin. The value of these is greatly increased by the fact that they have not confined themselves to purely neuroendocrinological topics but include discussions on such problems as assay methods and the physiological significance of the various actions of oxytocin. The chapter by McCann and Dhariwal on hypothalamic releasing factors is a good survey of the physiology of this sometimes contentious field, though not all workers would agree with their assessment of the physiological significance of the fact that vasopressin can act on the anterior pituitary to cause the secretion of adrenocorticotrophic hormone, that is as a corticotrophin releasing factor or CRF. Their conclusion that the releasing factors are polypeptides may need to be revised in the light of more recent findings that were not available to them at the time their contribution was written. The remainder of the book deals mainly with the control of the secretion of specific pituitary trophic hormones; an interesting and successful innovation is a separate discussion of the secretion of gonadotrophin in the male by Davidson. The general standard of these chapters is high, but three are of particular interest. Reichlin deals comprehensively with the pituitary–thyroid system, emphasizing the necessity for an integrative approach that considers the interaction of a "neural" stimulus from the hypothalamus and a "humoral" feedback control, taking into account the physico-chemical state of the target organ hormone in the blood and variations in the rate of disposal by the peripheral tissues. Mulrow discusses the control of aldosterone secretion, giving due attention to neural factors, established and postulated, but also to the renin–angiotensin system and other influences on the adrenal cortex. Meites, in a wide ranging review, gives a detailed account not only of the neuroendocrine but also of the many other factors that must be considered in the discussion of the physiological control of mammary gland growth and lactation. There is some danger that to concentrate exclusively on purely neural factors may lead to neglect of the other mechanisms that can affect the activity of the endocrine glands. These three articles show how the importance of neuroendocrine control is best seen in the context of a wider analysis of system function in the whole animal.

This volume has been produced and edited to a high standard, but a confusing transposition of lines was noted in the section on neurosecretion (page 146) and one *non sequitur* (section VB, page 546 of Chapter 13) appears to have escaped notice. The other aspect of brain–hormone interaction, the study of the effects of hormones on the central nervous system, will be the main theme of a second volume from the same editors. Together the two volumes should provide a detailed and comprehensive survey of the literature of a rapidly developing but rather diffuse subject that will be of value to the research worker and to the senior student who has already acquired a sound basic knowledge of endocrinology.

K. BROWN-GRANT

University News:

Liverpool

MR F. SAWKO, reader in civil engineering in the University of Leeds, has been appointed to the new second chair in civil engineering, and Mr R. K. Penny, assistant director of research in the University of Cambridge, has been appointed to the new chair of engineering design and production.

London

THE following titles have been conferred: professor of mechanical engineering, on Dr T. H. Lambert, in respect of his post at University College; professor of physics, on Dr D. H. Martin, in respect of his post at Queen Mary College; professor of rational mechanics, on Dr F. A. E. Pirani, in respect of his post at King's College; professor of psychology, on Dr P. H. Venables, in respect of his post at Birkbeck College; reader in electrical engineering, on Dr R. M. Redwood, in respect of his post at Queen Mary College. Professor D. V. Lindley, professor of statistics in the University College of Wales, Aberystwyth, has been appointed to the chair of statistics tenable at University College, and Dr J. H. E. Cohn, lecturer in mathematics at Bedford College, has been appointed to the readership in mathematics tenable at Royal Holloway College.

CORRESPONDENCE

What Place for Engineers ?

SIR,—On June 17 you commented on Professor Thring's article advocating the establishment of an academy for engineers. Much of this discussion was based on the example of the recently created National Academy of Engineering in the United States which, as you rightly said, has a number of features which would not easily fit into the British scene. May I draw your attention to the experience of an earlier and well-tried example of engineering academy, namely, the Royal Swedish Academy of Engineering Sciences (Ingeniörsvetenskapsakademien, IVA)? This body, having developed in a European country, has many features worth considering in relation to present British engineering and industrial needs.

The Swedish Academy, established in 1919 and hence the first of its kind in the world, was a deliberate attempt on the part of an influential group of Swedish industrialists and engineers to correct a national situation. Sweden has for long enjoyed an eminence in fundamental research which is great in relation to the size of the population. By the end of the First World War, however, the draw of academic research was so strong that industry became concerned that only a small proportion of the best scientific minds of the country were willing to take up applied work. A conscious attempt was therefore made to create a centre for the applied sciences with status and scientific acceptance to provide a reasonable balance of attraction. The decision was not to create an engineering academy in the general sense, but a Royal Academy of Engineering Sciences. This was done with the personal interest and participation of the King, who became its patron. The director of the Academy was given the title of Professor to provide the necessary academic respectability and the Crown Prince attended a number of early meetings, thus symbolizing the importance of the new institution in the eyes of the State.

The result has been outstandingly successful and, although it would be extravagant to claim that the success of Sweden during the past few decades in creating highly competitive science based industries is due to the Academy, nevertheless its part has been very great. IVA has not only succeeded in achieving for the engineer

a high status in society and public interest in his work, but has greatly encouraged the penetration of the scientific approach within engineering itself.

The Academy has been particularly fortunate in having at its head three outstanding men: Axel Enström, Edy Velander and now Sven Bröhult, very different personalities but each uniquely appropriate for the phase of development which he has led.

An important feature of IVA's activity is the annual commemoration meeting held each October on the anniversary of the granting of its charter. This is a splendid occasion, attended generally by the king and the élite of Sweden in addition to the members of the Academy, at which the director is bound by constitution to deliver a survey of the development of science and technology during the past year. This has provided a series of brilliantly staged demonstrations and lectures on new technological developments which have brought to the attention of the informed public many of the important applications of science, often long before their significance has been generally recognized.

This is not the place to describe the work of IVA in detail. But it should be mentioned that it consists of a maximum of 200 persons under 65 years of age. There are ten sections—mechanical, electrotechnical, building, chemical, mining and metallurgical science, computer engineering, basic science, forest and wood technology, economics and biotechnics. Each section is allotted a statutory number of seats. Once a member reaches the age of 65, his seat is no longer counted (although his membership continues) and a new member can be elected. This arrangement enables a steady rejuvenation of the body. Members are engineering scientists of prominence from industry, higher education and research institutes. IVA has done much to promote the establishment of new research institutes, particularly for borderline subjects, and is frequently called on to advise the government.

Far from exacerbating the difference between scientists and engineers which you fear, IVA has built a bridge between them and has the respect and support of the academic scientists.

Yours faithfully,

ALEXANDER KING

Director for Scientific Affairs,
OECD,
Paris.

Applying Research

SIR,—While one would agree that some of the points made by Professor Temperley (*Nature*, 214, 1378; 1967) are valid, I would like to take issue with one of them.

He says that he "once interviewed a distinguished PhD of several years' standing whose job was to devise schedules of cutting up steel rod and plate in order to fill orders with minimum wastage!". Professor Temperley hoped this was a very extreme case of inefficient use of scientists.

In fact this particular problem is very important. In the special case of minimizing waste in cutting orders out of steel plate it is mathematically intricate and poses great difficulties. This, however, is not the point at issue, which is the value of this sort of work to the steel industry.

At present about 4 per cent of steel production is waste, due, amongst other things, to the problem of cutting up orders out of batches of steel. This represents an annual loss of about £6m a year. Hence, although at first sight this seems a trivial problem, it is, on a national scale, most important, and any PhD scientist who could save a few per cent of this £6m would be making a sizable contribution to his employers' economic wellbeing. In addition, of course, general solutions to this problem could be applied not only throughout the steel industry but also to other industries, including glass and paper manufacture where similar problems arise and where important economies remain to be effected.

Yours faithfully,

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Titles

SIR,—I have read the letter from Mr Eugene Munroe in Nature (214, 1064; 1967) concerning titles. I trust that you will not be swayed by his arguments.

Surely the function of the titles of articles in *Nature* about general scientific policy is that they should be "catch-reader". Far too few scientists, I fancy, concern themselves with such matters and anything which can trap them into broadening their outlook and thinking is to be welcomed. To set against this socially desirable end the convenience of people who want to have "a card file on scientific policy" is to be irresponsible to the scientific community as a whole.

Yours faithfully,

D. W. EWER

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Pharmacology

SIR,—A drug has been defined as "any chemical substance that, administered to a living organism (or its part), gives rise to a scientific paper". Although drugs may be administered for other purposes than scientific investigation, this purpose concerns us now.

Reading through the classified list of Letters to the Editor in this week's *Nature* (July 1, 1967), I notice six letters on the effects of drugs, but no heading of Pharmacology, which is the science of drugs. One of these letters is placed under Physiology ("Inhibition of Gastric Acid Secretion by a Purified Bacterial Lipopolysaccharide"). Two are under Pathology ("Effect of *Cyclo*phosphamide, 6-Mercaptopurine or Methotrexate on the Furth Rat Leukaemia" and "Demonstration of Copper and Acid Phosphatase Activity in Hepatocyte Lysosomes in Experimental Copper Toxicity"). Another pharmacological letter is placed under Biochemistry ("Effect of Actinomycin on Protein Synthesis by Lymphocytes"). The fifth letter is under Microbiology ("Action of Ethidium Bromide on Growth of Herpes Virus in Cell Cultures") and the sixth under Biology ("Toxicity of Tobacco Smoke to the Spotted Alfalfa Aphid *Therioaphis maculata* (Buckton)").

Concerned as it is with the use of chemical substances to explore the nature of life, pharmacology is a meeting point of chemistry and biology and therefore a subject that is growing fast. To deny it a place among the headings of your letters distorts the picture of how work is distributed in the various fields of research. It also forces pharmacologists to search harder for what they ought to read. Does this forced searching not deny a simple extension of your own thesis that "the professional reader is the one most concerned to know precisely what claim on his attention an article sets out to make" (*Nature*, June 10, 1967, Vol. 214, p. 1078)?

The removal of the subject head Pharmacology from the classification of Letters to the Editor is not a pleasing change.

Yours faithfully,

H. O. J. COLLIER

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