Fig. 3. TIME-CONCENTRATION CURVE (EXPLANATION IN TEXT).

against concentrations, these values yield a hyperbolic time-concentration curve shown in Fig. 3. As can be seen from the magnitude of the standard error of the mean values there is a considerable scatter of the individual readings within each group. This is only to be expected in view of the fact that the experimental animals were obtained by trapping in various localities, and differed not only in size and age but also in other respects, such as amount of fat body, hydration of tissues, etc. A further factor responsible for such variations in 'survival time' is the difficulty in the application of a standard amount of insecticide. The solutions were applied freely all over the exposed tissues of the preparation by means of a No. 1 water-colour brush, every care having been taken that no part of the ventral nerve cord was left protected by remnants of fat body. Differences in the amount of body fluid present, however, can have quite a decided effect on the speed of penetration of the oily pyrethrin solutions into the nervous tissues.

The discriminating power of this method is fairly poor for concentrations above 0.33 per cent total pyrethrins, a concentration which seems to represent an upper limit above which an increase in pyrethrin content does not proportionally hasten the drug's toxic effect on the exposed nervous system. The observed mean difference in survival time for 0.23 per cent and 0.13 per cent solutions is, however, of a completely satisfactory statistical significance. At this point of the range of concentrations the method is most sensitive, and the clear discrimination between the physiological effects of two solutions differing by only 0.1 per cent in their total pyrethrin content compares quite favourably with the maximum sensitivity to a difference of 0.2 per cent total pyrethrins yielded by the method of biological assay described by Parkin¹. The fact that the physiological method of assay here described is most sensitive near the lower end of the scale of concentrations is a necessary consequence of the direct application of the insecticide to the exposed nervous tissues. For intact insects a comparable critical range of concentrations seems to lie in the neighbourhood of 1.6 per cent or 1.3 per cent total pyrethrin content. This factor has to be taken into account in comparing the results gained by the two different methods of assay. It is tentatively

suggested that there is an approximate correspondence in toxic effect between a 1.6 per cent pyrethrin solution when applied externally, and a 0.3 per cent solution of the same composition on direct application to the exposed nervous system.

The advantages of the physiological method, which, apart from its usefulness in qualitative tests, appears to be especially suitable for the preliminary quantitative assay of relative toxicities, may be summed up as follows:

(1) The test animals (cockroaches) are easily obtainable and ten animals only are necessary for each test. More valuable insect material can thus be saved for a small number of final 'biological' tests.

(2) The exposure of the nervous system does not represent any technical difficulty; the preparation can be mounted for electrical observation within two to three minutes from the beginning of the dissection, and the ten experiments necessary for each test can be completed in a maximum time of 5-8 hours.

(3) The sensitivity of the method is unexpectedly satisfactory, considering the variability and relatively small number of test insects used.

(4) The fact that acoustical diagnosis is completely sufficient to furnish a satisfactory end point at low amplification renders the use of a costly oscillograph and recording camera unnecessary. The apparatus need therefore only consist of a standard 3-4-valve resistance capacity coupled amplifier in conjunction with a one-valve power stage and a loudspeaker.

(5) The experimental procedure as adapted for practical testing is sufficiently simple to be carried out in a routine way by any trained biologist. It does not call for specialized experience in electro-physiology.

¹ Parkin, E. A., *NATURE*, **149**, 720 (1942).

² Pumphrey, R. J., and Rawdon-Smith, A. F., *Proc. Roy. Soc., B*, **122**, 106 (1937).

OBITUARIES

Mr. M. P. J. Swift, and Mr. M. J. Swift

THE name of Swift has been associated with the manufacture of scientific instruments since the inception of this firm in 1852, and has been a household word whenever microscopes have been mentioned. By the death of Mansell Powell John Swift on October 12, 1942, at the age of fifty-seven, the firm has lost one of its outstanding figures. M. P. J. Swift was educated at University College School, London, and entered the firm when he was eighteen. He did much towards raising the microscope to its present high standard of precision, especially by attention to detail both in its optical and mechanical requirements. His interest in the development of the polarization microscope was well known, and the various optical accessories connected with this branch of work (for example, Nicol, Glan-Thompson prisms, retardation wedges, etc.), always difficult to make, held a peculiar attraction for him. His energy, enthusiasm, and thoroughness in all he undertook was maintained to the end: a most likable man, who will be greatly missed by all who knew him.

By a strange coincidence, Mansell James Swift, father of M. P. J. Swift, died within one day of his son, namely, on October 13, at the age of eighty-

eight. He was apprenticed to his father James Powell Swift (1826–1906), who founded the original firm, and who himself served as an apprentice with Messrs. Ross, Ltd. He was a fellow of the Royal Microscopical Society for thirty-six years.

The interest in scientific and optical instruments displayed by the three members of the firm mentioned above goes back yet one more generation. Thomas Swift (1799–1882), father of James Powell Swift,

although at one time a hosier in Fenchurch Street, London, was sufficiently interested in scientific instruments to open such a business in Bendigo, Australia, where many microscopes were sent out to him by his son.

With such a background, the name of Swift will doubtless continue to be associated with optical instruments and microscopes of high quality.

B. K. JOHNSON.

NEWS and VIEWS

Prof. D. B. McQuistan

PROF. D. B. MCQUISTAN, who recently retired from the Freeland chair of natural philosophy in the Royal Technical College, Glasgow, has now, through failing health, been forced to relinquish a lifetime devoted to the cause of education. A brilliant student of the University of Glasgow, he was awarded the Thomas Logan Memorial Medal and Prize for the most distinguished graduate in arts of his year, with first-class honours in mathematics and natural philosophy, and in classics. The William Houldsworth research studentship afforded him the opportunity of spending a profitable year at the University of Cambridge, and, along with his later services as a mathematical teacher, he was well equipped for the duties of the chair which he afterwards occupied with great distinction. Many thousands of students will remember with gratitude his lucidity as a lecturer, and his exceptional aptitude in clarifying any difficult mathematical or scientific complexity. His popular lectures of scientific interest to varied audiences were an inspiration to the expert and a delight to the novice.

On his retirement, Prof. McQuistan was chairman of the Board of Studies at the Royal Technical College, and for many years he did invaluable and onerous work as convener of the Business Committee of the General Council of the University of Glasgow. His colleagues in the Dumbartonshire Education Authority will undoubtedly miss his unfailing and ungrudging service. His logical mind and calm temperament were always conducive to wise decisions. With unerring instinct he foresaw the possibilities of the film as an aid to education, and was convener of the Advisory Committee on the Production of Educational Films, under the auspices of the Scottish Film Council. Prof. McQuistan's present absence from active participation in educational matters creates a void, and his many acquaintances will cherish his great teaching qualities, his brilliant intellect, and, above all, his charming and lovable personality.

Ignaz von Born

ON December 26 occurs the bicentenary of the birth of Ignaz von Born, one of the first to realize the great part fossils were to play in historical geology and the first to describe the use of mercury in the extraction of gold and silver. Born at Carlsburg in Transylvania, he was educated at Hermannstadt and

Vienna, and studied law at Prague. He then made a journey through Germany, Holland and France studying the minerals, mining, etc., and a year or two later made another mineralogical journey through Hungary and Transylvania. An account of this second journey, in the form of letters, was published in 1774 by the Swedish mineralogist, J. J. Ferber (1743–90). At Prague, where he held a post as mining councillor, Born assisted in forming a scientific society. In 1776 he was called to Vienna by the Empress Maria Theresa to arrange the natural history collections, which he afterwards described in a fine work. He continued to reside at Vienna until his death on July 24, 1791. One of the last of his books was his "New Process of Amalgamation of Gold and Silver Ores . . ."

Born's "Travels through the Banat of Termeswar, Transylvania and Hungary" and his book on "Amalgamation" were translated into English by a clever but unscrupulous German, Prof. Rudolf Erich Raspe (1737–94), who after stealing coins from the collections at Cassel fled to England, where he was already a foreign member of the Royal Society. After a period Raspe's name was struck off the rolls of the Society and he took to writing for a living, and while acting as store-keeper and assayer at Dolcoath Mine in Cornwall wrote the original part of "Baron Munchausen's Narrative". Later on, Raspe obtained money from the public-spirited Scottish baronet, Sir John Sinclair (1754–1835), by pretending to discover gold and silver on his estate at Ulbster, Caithness, an incident commemorated by Scott's character "Dousterswivel". Sinclair, it may be added, was one of the subscribers to Raspe's translation of Born's "Amalgamation".

Research on Coal Utilization

SIR EVAN WILLIAMS announced, in his presidential address to the British Coal Utilization Research Association on December 17, that a scheme utilizing £1,000,000 in five years for research on coal has been prepared. He said that this is by far the largest co-operative research scheme ever undertaken in Great Britain for the development of an industrial asset. The scheme has been approved by the Department of Scientific and Industrial Research, which has undertaken to contribute £50,000 a year to the cost, and £250,000 over the five years. The Mining Association will contribute £80,000 a year and £400,000

We regret to announce that it will no longer be possible, on account of the limited supply of copies of NATURE available, to give authors of "Letters to the Editors" more than one copy of an issue in which their contribution appears.