

scope of which are as yet insufficiently appreciated and that the time is not far distant when man, largely independent of the accident of geographical or climatic environment, will rely very considerably on the chemist to provide substitutes. The chemist is a brilliant example of the truth that scientific research leads through the elimination of waste to the conservation of resources. In an age of industrial research directed to the production of immediately practical results, the question arises whether, in the highly developed sciences, we have gone too far in the direction of intensive scientific research with the object of gaining immediate benefits at the expense of more general research in the less developed sciences which might ultimately yield social benefits of no less value, though more remote. Lord Leverhulme suggested that if the law of diminishing returns operates in scientific research, it might well be better to devote more of our resources to the less developed and less immediately profitable sciences.

Chemistry, Past and Present

IN Prof. G. G. Henderson's absence, owing to the death of Mrs. Henderson, his medallist's address at Harrogate on July 6 to the Society of Chemical Industry, "A Retrospect of Chemical Science," was read by his colleague at Glasgow, Dr. D. T. Gibson. Prof. Henderson, an original member of the Society, who in 1888 was responsible for organizing the first annual meeting in Glasgow, reviewed developments in chemistry in the last sixty years, including present-day tendencies, and in referring to post-War advances in applied chemistry in Great Britain, commented on the increasing demand for the services of chemists not only by chemical industries but also by many other industries, and on the marked appreciation of the importance of chemical research. In particular, he referred to the importance of the contribution of the chemical engineer in the development of chemical industries, as indicated by the provision of facilities for his training, and the foundation of the Institution of Chemical Engineers and of the Chemical Engineering Group of the Society. The future prosperity of Great Britain, Prof. Henderson urged, largely depends on the support given to the progress of science and especially of chemistry, and in this matter a united profession is of the utmost importance if its influence on public opinion or on Government departments is to be effective. For this reason, he pleaded for generous support of the Chemical Council and the scheme for a Chemistry House, and in particular urged that important firms employing considerable numbers of chemists should do more to encourage their staffs to become individual members of at least one of the publishing societies.

"Applied Anthropology"

IN view of the frequency with which, it is now generally recognized, problems of administration among backward peoples are intimately bound up with matters of belief and custom, and give rise to problems of which the many ramifications cannot be understood, or perhaps even perceived, without

anthropological study, or upon which it may be necessary to seek the advice of the expert anthropologist, an announcement made by the Royal Anthropological Institute is both welcome and opportune. The Council of the Institute, it is stated, has appointed a Standing Committee on Applied Anthropology, which will meet at regular intervals for the discussion of problems of culture contact and the application of anthropological knowledge to the government of subject races. The Committee will seek to stimulate popular and official interest through the publications of the Institute, representations to Colonial Governments through the Colonial Office, and personal contacts with officials. It will also endeavour to further the organization and systematization of research in this field by means of discussion within the Committee and with experts engaged in research, and by promoting field-work according to a considered plan. A programme of typical questions affecting administration and upon which further research is desirable, has already been drawn up. In view of the wide connexions of the Institute and its close relations with those having expert knowledge in every part of the Empire, the work of the Committee cannot fail to be of the greatest utility in promoting a wise and enlightened policy in the administration of the affairs of the less-advanced races for whom the Imperial Government is responsible.

Need for the Study of Human Biology

IN an address at the celebrations of centenary of the University of Michigan on June 17, Prof. Raymond Pearl emphasized the necessity of evolving a science of human biology broad enough to synthesize our knowledge of man's mental and spiritual nature as well as of his physical nature if civilization is to survive. Our rapid advance in material things, while in wisdom and goodness little or no advance has been made, renders our development so lopsided as to threaten a catastrophe. The data for the unification of human knowledge do not yet exist, and one of the main challenges of the present situation to the man of science is that by natural aptitude and training he is the best equipped to obtain such data. Prof. Pearl believes that the universities, rather than specially founded independent institutions, offer the best environment for scientific research, and the achievements of the last hundred years encourage the belief that progress will continue.

The Bournemouth Outbreak of Typhoid Fever

THE report of the late Dr. Vernon Shaw, on his investigations into the outbreak of enteric or typhoid fever that occurred in Bournemouth, Poole and Christchurch in August and September 1936, has been issued by the Ministry of Health (Reps. on Pub. Health and Med. Subjects, No. 81. London : H.M. Stationery Office. 9d. net). The outbreak was first brought to the notice of the Ministry on August 21, 1936, and Dr. Shaw began his investigations the following day. He was informed that thirty cases of enteric fever had been notified during the preceding

twenty-four hours, and that a number of other patients, scattered throughout the three towns, were under observation. The only factor common to all the patients was the consumption of raw milk retailed by one distributor. It was concluded that the milk was infective for a period of about thirty-one days preceding August 22, and the approximate number of persons who contracted the disease was 718, of whom 518 were residents, and of these fifty-one died. No source of infection could be discovered among those distributing the milk, nor at the retailer's depot. The supply was collected from thirty-seven farms scattered throughout a large part of Dorset. Dr. Shaw was satisfied that the outbreak was due to the consumption of raw milk, and that the dealer's supply was infected by the contributions of one or possibly two producers whose milk in turn was infected by water from a contaminated stream. Immediately the outbreak was recognized, the distributor, acting on Dr. Shaw's advice, pasteurized the whole of his supply, and no unpasteurized milk was distributed after the morning round on August 22. This measure was immediately successful in terminating the outbreak.

Poetry and Astronomy

DR. F. W. Grover, professor of electrical engineering, Union College, Schenectady, N.Y., has contributed to the *Scientific Monthly* of June an article in which are brought together a number of striking passages in poetry referring to astronomical objects and phenomena. Milton, Dante, Tennyson and Longfellow are naturally given the chief prominence in these extracts, but there are also beautiful passages from Browning, Housman and others. Dr. Grover refers appreciatively to Mr. Alfred Noyes's "Watchers of the Sky", but wonders why the new knowledge of the starry heavens makes so small an appeal to contemporary poets, whose fancies rarely stray into this virgin field. "Yet," he says, "it would be a fascinating task, and one demanding no mean ability, to picture the whirl of the spectroscopic binaries, and the rhythmic oscillation of the Cepheid variables, to describe the individualities of the giant and dwarf stars, or to soar in imagination to the confines of an expanding universe."

Progress in Gliding

RECENT numbers of the *Sailplane and Glider*, the official organ of the British Gliding Association, give evidence not only of the advances that have been made in the technique of motorless flight, but also of the scientific knowledge that it is producing. The development of aeroplanes has been so spectacular that development of sailplanes may be overlooked. But these have attained an airspeed of 87 m.p.h., a straight line distance of 313 miles and a height of more than 19,000 feet; records all beyond those of power planes in 1911. It has long been a reproach that sailplanes were dependent on hills and winds; but an effort was made last June to meet this by the organization of a cross-country circular tour. A definite route of 415 miles, beginning and ending at

Darmstadt, was laid out, the time allowed being ten days and each separate flight was to start with an aeroplane tow to not more than 500 metres. Of the eight pilots who got away, four completed the course in the time, the first taking only seven days. The use of 'thermals'—ascending currents apart from clouds—has become more widespread. Of late, at four or five English gliding centres, pilots have been pulled up to a few hundred feet by a winch and have got away without any help from the wind or from a hill.

On the scientific side, the practice of soaring inside clouds, as well as the use of thermal currents and of cold fronts, has given valuable meteorological knowledge. Soaring in clouds not infrequently proves adventurous. Last June, for example, a German pilot went into a cloud to gain height and his rate of ascent increased from 4 m. a second to beyond what his variometer would register. When he was at 16,400 feet he tried in vain to get out of the cloud; he was tossed up and down, thoroughly chilled and bombarded with hail; the climax came when a wing broke off. However, the pilot with difficulty got clear, and descended to safety in his parachute. Naturally those who take such risks want to learn all they can about the conditions; and while some carry special recording instruments, others work out the paths of air in thermals or make and study fast-motion cloud pictures. As an illustration of the data brought by such means may be quoted the records of pressure, temperature and humidity obtained during a flight from the Chiemsee across the Tyrolean Alps into Italy; the pilot rose to 10,800 feet to cross the Gross Venediger. Meteorologists doubtless have shrewd ideas as to what goes on in such places as cloud-cells and lenticular clouds; but there, as well as in many other regions, definite observations must have the highest possible value.

Monthly Meteorological Elements

IN the *Meteorological Magazine* of June there is a new feature that has been developed as a result of a proposal made by Prof. A. Wagner at the International Meteorological Conference at Copenhagen in 1929, that monthly mean values of various meteorological elements should be broadcast as soon as possible after the end of each month for selected meteorological stations. The arrangements for carrying out this proposal were completed and ratified at the Warsaw Conference in 1935, and provided for the inclusion in the broadcasts of mean pressure in millibars or millibars and tenths of a millibar, mean temperature in degrees and tenths, total rainfall in centimetres, and, for certain places, resultant air transport for the month. Since the first broadcasts were made in June 1936, the selected stations have increased in number, and data for Russia, Siberia and America are now included. The figures for May 1937, except those for air transport, have been discussed in the journal mentioned above, pressure and temperature being plotted so as to show cartographically the main features of those elements of the weather for that month over a large part of the northern