Another reason which makes the need of a topographical map of first importance is the question of geological survey. Geological information is deprived of a great part of its value until it is correctly plotted on a reliable map. Perhaps the best example and proof of this is the case of the Geological Survey of the United States. In that rapidly developing country it was felt that geological survey must be pushed on as fast as possible. The geologists found, however, that they must have good topographical maps ; and there being none in existence, they set out to make them ; with the result that the Geological Survey of the United States includes the topographical survey. In South Africa the same considerations apply with peculiar force ; and it seems incredible in a country where geological survey and mineral development have such possibilities, that the value of a topographical map should have been so long ignored.

The present situation with regard to topography in South Africa is as follows : There is a good topographical survey (1 : 125,000 scale) of the Orange Free State, with an extension for a short way into the Transvaal. There is a 1 : 250,000 survey of Basutoland and of the northern part of the Cape Province. The latter is classed as a 'reconnaissance' survey ; it is useful, but in Cape Colony at any rate scarcely adequate to the needs of the dominion. Of the remainder—about half of the Cape Province, almost the whole of Natal and the great bulk of the Transvaal—no topographical map exists. It will be seen that a vast amount remains to be done in the way of topography.

It is true that a start has been made with topographical survey of the country. The Director of the Trigonometrical Survey has been charged with this duty, and a sum of money has been allotted for it. The sum seems to an outsider, considering the immense amount of work which has to be done, to be extraordinarily small. It is something that the principle has been recognised, but no adequate progress will be made until a much larger sum is allotted. The question is also bound up to a large extent with that of staff. So far as I am aware, the Director of Trigonometrical Survey has no permanent staff for field work, and very little for work in the office. This is to be regretted. In my view a government survey ought to have a regular permanent staff ; otherwise it is liable to have fluctuations in the quality and quantity of its work which are most undesirable. It may of course be convenient, and usually is in the early stages of a survey, to have in addition a certain number on a temporary basis. The same observations apply to the staffs of the surveyors-general. In all cases there should in my opinion be a staff of permanent government employees. All experience goes to support this view. The example of Canada may be quoted. Cadastral surveys there used to be put out to contract, but this was dropped in 1915, and I am informed that all the men engaged on survey work are now civil servants. It is to be noted that the Survey Commission laid particular stress on this point, especially in the case of the trigonometrical and topographical surveys.

The most satisfactory feature in South African survey is perhaps the triangulation ; it is all of good quality, and is being pushed on as fast as funds will allow ; but there is undoubtedly a great need of extension in the second and particularly in the third order triangulation. Some levelling has been done, but nothing as yet in the way of closed circuits ; so that levels are at present, to use a common expression, hanging in the air. All surveyors know that it is impossible to check the accuracy of any levelling, and to distribute the errors, until the work has been closed on the starting point.

South Africa has a great survey tradition behind it. Some of the greatest survey schemes were started in this country ; some of the finest survey work in the world has been done in it ; and some of the best surveyors of the Empire have been trained here. South Africa ought not to be content to lag behind other nations in this matter.

Obituary.

PROF. S. B. SCHRYVER, F.R.S.

BY the death of Prof. S. B. Schryver, which occurred on Aug. 21, an active worker in biochemistry—still in the prime of his intellectual powers—has passed away.

Samuel Barnett Schryver was born in London in 1869, the son of the late Lewis Schryver. He was educated at University College, London, and at Leipzig, his first appointment being that of assistant lecturer and demonstrator of chemistry at Liverpool. Afterwards he returned to London as lecturer on physiological chemistry at University College and chemist to the Research Institute of the Cancer Hospital. In 1913 he was chosen as assistant professor at the Imperial College of Science and Technology, and in 1920 he was appointed professor of biochemistry at the College. He was elected a fellow of the Royal Society last year.

About a hundred papers and notes stand to Schryver's credit. In 1890, in collaboration with Prof. J. Norman Collie, he showed that when a mixed quarternary ammonium chloride or hydroxide is heated, a mixed tertiary amine is produced, and in the following year he proved the existence of stereoisomeric quarternary ammonium compounds, thus confirming the view of Hantzsch and Werner. His work on the oxidation products of turpentine oil threw much light on the constitution of camphoric acid. Based on the fact that ammonia is liberated when sodamide and phenols interact, he devised a method of estimating these compounds. He worked on morphine, and studied the effect of feeding animals with thyroid.

Schryver's most important work was undoubtedly that connected with the proteins. He published a monograph on "The General Characters of the

Proteins" (Longmans' series) in 1909. In 1905 and 1906 the independent work of Schryver and Leathes proved that proteins are assimilated as amino-acids, the greater part of which is converted into urea by the liver cells and excreted by the urine. He was successful in applying Siegfried's carbamate method for the separation of the products of hydrolysis of the proteins, and by its means he was able to isolate several hitherto unknown substances. Among these may be mentioned oxylysine, $C_6H_{14}O_3N_2$, from isinglass, albumin of cabbage leaves, and edestin. Protoctine, $C_8H_{15}O_3N_3$, was obtained from oat protein.

Connected with his work on proteins, a series of ten papers on gelatin by Schryver and his pupils appeared between the years 1921 and 1927. The main object of this inquiry was to obtain a product of better technological value than commercial gelatin, and most of the work is therefore embodied in Reports to the Adhesives Research Committee of the Department of Scientific and Industrial Research. This work brought him into connexion with numerous firms manufacturing adhesives, to which he acted as consultant. Regarded as a whole, the work stands out not only from its industrial merit, but also as a notable contribution to pure chemistry, in which refined methods of physical chemistry were brought into use.

Gelatin was found to possess nearly all the properties of a globulin, but even when purified by treatment with 0·2 per cent caustic soda and by repeated flocculation in an electric field, it is shown not to be a chemical entity. When the purified substance is heated with water, treated with acids or alkalis, or repeatedly flocculated in an electric field, the hydrolytic products show an increase in the nitrogen that will not react with nitrous acid. Do not these observations of Schryver indicate the necessity of tempering our conclusions—drawn from the chemical substances we isolate from a given neutral product—with caution? The proteins, the polysaccharides, etc., exist in Nature in a form combined or co-ordinated with other substances.

In 1923 a communication was made from Schryver's laboratory showing that a crystalline carbohydrate can be separated from cabbage leaves in a yield of 0·01 per cent. It is non-reducing and its constitution is probably

$$CH_2OH \cdot CH(OH) - O - CH_2OH.$$

Several important papers emanated from Schryver's laboratory on the chemistry of pectins and their relation to the so-called hemicelluloses and other cell-wall constituents of plants. His work corroborated the ring formula assigned to pectic acid by work in my own laboratory. In 1910, Schryver found that formaldehyde is formed during the insolation of green leaves, but that it exists in combination with chlorophyll. In the course of this he improved Rimini's test for formaldehyde so that it became sensitive to a concentration of 1 in 1,000,000. Among researches in physical chemistry Schryver worked on the state of aggregation of matter and on clot formation, the latter explaining the formation of casein from caseinogen by rennet and the effect of salts.

Prof. Schryver was a man of great personal charm who endeared himself to all his colleagues and pupils. His work was essentially original, based strictly on experimental results without the slightest bias of convention.

ARTHUR R. LING.

WE regret to announce the following deaths:

Dr. J. R. Eckman, associate chemist in the U.S. Bureau of Standards and lecturer in physical chemistry at George Washington University, on Aug. 1, aged forty-one years.

Dr. H. C. Frankenfield, who was in charge of the river and flood service of the U.S. Weather Bureau, on July 31, aged sixty-six years.

Prof. W. H. Perkin, F.R.S., Waynflete professor of chemistry in the University of Oxford, on Sept. 17, aged sixty-nine years.

Dr. J. M. Purser, Regius professor of physic in the University of Dublin from 1917 until 1925, and author of a "Manual of Histology" and of numerous papers on physiology, pathology, and medicine, on Sept. 18, aged eighty-nine years.

News and Views.

IN commenting as we did in these columns in our last issue on Dr. Bonhoeffer's recent work on hydrogen, we should have directed attention to the fact that in NATURE of Feb. 2 this year (p. 160) we published an account of experiments made by Prof. J. C. McLennan and his co-worker, Mr. J. H. McLeod, that established the existence in liquid hydrogen of two distinct kinds of molecules. In these experiments it was shown that when liquid hydrogen was irradiated with the light from a mercury arc, Raman effects were obtained that indicated that both sets of molecules were set into oscillation with the same *vibration* frequency, namely, 4159 cm.$^{-1}$. One of the sets of molecules was, however, set *rotating* with a frequency of 354 cm.$^{-1}$, corresponding to a transition from a zero to a two-quantum rotational state, while the other was set *rotating* with a frequency of 588 cm.$^{-1}$, corresponding to a transition from a single-quantum rotational state to a three-quantum one.

THESE experiments showed that in liquid hydrogen we had some molecules in a zero-vibrational and zero-rotational state and others in a zero-vibrational and first quantum rational state. Intensity measurements showed that there were considerably more (at least twice as many) molecules in the second state than in the first one. The distinctness of the two states was emphasised by the fact that no Raman effects were obtained corresponding to $m=0$ to $m=1$ or $m=1$ to $m=2$ rotational transitions. Dennison, it is well known, in attempting to explain anomalies in the specific heat of hydrogen, had shown by the use of wave mechanics that hydrogen at low temperatures should be regarded as a mixture of two effectively distinct