

similar to those used in practice. At high current densities, the ions are transported through 'Permaplex' C-10 and A-10 membranes faster than they can get to the membrane interface. At low current densities the transport numbers decrease with decreasing current density because concentration diffusion partially counteracts the electrical migration. When this effect is allowed for, the true transport number of the sodium ion in 'Permaplex' C-10 in 0.1 N solution is found to be 0.98, and its diffusion coefficient 8.1×10^{-8} cm.²/sec. J. F. DUNCAN

RAINFALL STATISTICS IN THE BELGIAN CONGO

IN standard books of climatology published even since 1945 laments are to be found about the scanty nature of the data on the rainfall of equatorial forest areas. This reproach is now being rapidly removed and nowhere more rapidly than in the Belgian Congo, where the National Agronomic Institute has published during the past few years several detailed papers by F. Bultot. In a recent publication*, M. Bultot presents the first analysis, using modern statistical methods, of the rainfall regime in an equatorial continental tropical region without a monsoon wind regime. Rainfall in the Congo falls in scattered thundery downpours. The data used cover twenty-nine years for Eala in the north-west and for varying periods of more than twenty years for fourteen other stations in the area.

The problems investigated are the frequency of falls of different intensity, the probability for two or more days of rain exceeding 15 mm. to occur in succession, and the variation in the intensity of rainfall during a shower. It is found that rain of more than 0.1 mm. falls on one day in four and that the number of days in a year of 15 mm. or more of rain is less than ten or more than sixty on less than one year in twenty, and the number of days of 50 mm. and 80 mm. can only exceptionally exceed twelve and four, respectively. There is a marked annual variation, corresponding to the movement with the Sun of the tropical rainbelt, of days with 15 mm. or more of rain and a much less marked one, except in the central Congo where it vanishes, of days of 50 mm. or more.

A very interesting fact is that there is no persistence of heavy rainfalls. The probability, in fact, that 15 mm. or more will fall on the day following one with such amount is practically equal to the overall probability of a daily fall of that amount. In temperate regions there is appreciable persistence for rain days as a whole, though the degree of persistence for amounts of 15 mm. or more does not appear to have been investigated. The daily maximum expected to be exceeded only once in ten years is about 120 mm. and once in fifty years is 150 mm. It is pointed out that in Ireland the corresponding values are 64 mm. and 81 mm.

Study of a number of individual falls shows that the rate of rainfall is heaviest within a quarter of an hour from the beginning and rarely exceeds 2 mm. per minute. Only about 25 per cent of all falls

continue for more than four hours. The common opinion that tropical showers almost always occur in the afternoon is incorrect. It is found, however, that at most places there are relatively few showers during the morning. The afternoon showers are shorter and more intense than those at night. Finally, in a restricted study of area rainfall it is found that over areas up to 175 sq. km. the frequencies of a given amount diminish exponentially with the area.

There is no discussion of the synoptic meteorology of rain. Perhaps in a future publication M. Bultot will investigate such matters as the incidence of showers or absence of showers over wide areas and the corresponding stream-lines of wind flow.

G. A. BULL

LVOV GEOLOGICAL SOCIETY

THE Lvov Geological Society celebrated in 1956 the tenth anniversary of its foundation. Lvov Geological Society is attached to Ivan Franco's State University of Lvov, founded in 1661. There the teaching of geology began at the end of the eighteenth century, when the chair of geognosy and oryktognosy was founded, no doubt under the impulse of the prevalent Wernerianism. In 1852 a mineralogical museum and in 1864 a chair of mineralogy were established. The first professor of mineralogy was Ferdinand Zirkel (1838-1912), the distinguished pioneer of microscopical petrography. It was during his residence in Lvov (1864-68) that Zirkel published his "Lehrbuch der Petrographie" (1866).

The Lvov Geological Society is now a very vigorous institution, comprising more than a hundred and twenty members. It is subdivided into a mineralogical section, presided over by Prof. E. K. Lazarenko, and a regional geology section by Prof. O. S. Vyalov. There is also a branch at the Chernovtzy State University. The principal object of the Society is the promotion of the study of geology, petrology, mineralogy and mineral deposits of the Western Ukraine, as well as other parts of the Soviet Union. It is interesting to note, however, that many contributors to its periodical publication reside in places distant from Lvov and even outside the Soviet Union, for example, in Bulgaria, China and Bolivia. The Society, besides its normal activities, has two special functions, namely, the organization of special surveys or studies in either pure or applied geology, and also of conferences. The Society has already undertaken the following surveys: a geophysical survey of Lvov region; a geological and geomorphological survey of certain Carpathian regions; a petrographical and mineralogical study of igneous and sedimentary rocks; and finally, a specially organized survey of the Eastern Transbaikalian region in Siberia. The conferences organized by the Society comprise the subjects of tectonics, stratigraphy, petrology, economic geology and history of geology.

The publications of the Society are: (1) *Mineralogicheskyy Sbornik* (*Mineralogical Magazine*), each annual volume of some 400 pages containing about forty original papers; (2) *Trudy* (*Transactions*) of Lvov Geological Society, comprising geological, petroleum geology and petrographical series; (3) *Geologicheskyy Sbornik* (*Geological Magazine*), replacing *Trudy* since 1955; (4) monographs on the petrology of the Ukrainian crystalline massif, granite plutons of Kazakhstan, migration of oil, tourmaline, bentonite clays, the Eastern Transbaikalian region and Aldan

* Publications de l'Institut National pour l'Étude Agronomique du Congo Belge: Étude Statistique des Pluies Intenses en un Point et sur une Aire au Congo Belge et au Ruanda-Urundi. (Bureau Climatologique Communication No. 11.) Par F. Bultot. Pp. 90. (Brussels: Institut National pour l'Étude Agronomique du Congo Belge, 1956.) n.p.

region in Siberia. The high standard and the quality of print and illustrations of these publications are in no small measure due to the editorial board presided over by Prof. E. K. Lazarenko.

Besides these publications of the Society, there is also *Uchonye Zapisky (Scientific Annals)* of the University of Lvov, the Geological Series of which is edited by Prof. O. S. Vyalov.

The library of the Society contains more than 10,000 volumes and is constantly growing, partly due to a large number of exchanges with other societies, both at home and abroad. S. I. TOMKEIEFF

SOCIOLOGY IN THE UNITED STATES

FOLLOWING publication of its "International Register of Current Team Research in the Social Sciences", Unesco's series "Documentation in the Social Sciences" is now being extended by the addition of three reports covering recent trends in economic, political science and sociological research in the United States (Unesco: 19 Avenue Kléber, Paris, 16^e). In view of the enormous amount of social science research that is being pursued there, it has been thought most appropriate to give a bird's eye view of general tendencies and pre-occupations rather than seek to catalogue in detail all that is being done over a given time by every serious researcher. These reports have been commissioned from eminent specialists who are in close touch with developments and whose accounts constitute an authoritative guide to progress within these three major disciplines.

The work on sociology has been edited by Hans L. Zetterberg, of Columbia University, who traces its considerable growth in the past decade. In 1945, the American Sociological Society had 1,242 regular members; in 1954, 4,350 members—a gain of 250 per cent. Among about two thousand institutions offering instruction on a higher than secondary level, about 98 per cent have prospectuses listing courses under the heading 'sociology'. On the average, the four-year college offers about a dozen different sociology courses. It would appear that at least a third of the college population in the United States, during one time or another in their college career, follows a sociology course and that about one out of ten Americans at the age of twenty has followed at least one class in sociology. The bulk of students enrolling in sociology courses do so during their first or second year of college, that is, at an age between seventeen and nineteen. The majority of those teaching sociology to undergraduates in American colleges are indeed best compared with teachers in upper-sixth forms in grammar schools.

Slightly less than 2 per cent of college students choose sociology as their major field of concentration. Since there is no established occupation or profession of 'sociologist', these students select sociology with other vocational interests in mind.

About one-fifth select teaching and one-quarter various forms of social work, while one-tenth take up personnel work in industry. Many of the courses deal with marriage and family life, social problems and criminology. The social problems courses are not designed to help students 'solve' social problems but rather to open their eyes to their existence and to prepare them for participation in democratic discussion of these problems.

Some sixty universities offer graduate instruction in sociology and grant higher degrees. In 1953, for example, 141 Ph.D.s in sociology were awarded by these institutions.

The organization of an American graduate department in sociology shows several interesting contrasts with its European counterpart. For example, a typical European sociology department has one professor who is the administrative head and who also sets the tone for the scholarly orientation of the department. An American graduate department, on the other hand, contains several professors who do not usually represent the same school of thought; in fact, university administrators often make efforts to obtain representation from different specializations and occasionally even contradictory emphases. This gives the student a chance to learn different aspects of sociology without having to go to different universities. The graduate departments of sociology are also centres of sociological research, and most sociological projects undertaken in the United States are headed by a university professor. Most of these projects involve a staff of several people in addition to the person in charge. The excellence of American training in sociology is in no small part due to the widespread possibility for students to participate as research assistants in projects where they can learn this uncodified research tradition.

Several leading universities have found it convenient to organize separate agencies to handle larger aspects of social science research. Some of these agencies are adjuncts to the sociology departments, such as the Bureau of Applied Social Research at Columbia University and the National Opinion Research Centre at the University of Chicago; others are more independent agencies like, for example, the Research Centre for Group Dynamics at the University of Michigan. Several of these agencies are interdisciplinary in character and practice and may include psychologists, anthropologists, political scientists and economists.

The fact that more than one person is involved in the typical sociological research project means that the long tradition of research by the lone scholar has been broken. This type of organization makes it possible to complete large-scale projects in a short time, whereas the solitary research worker might have to spend a long time completing the routine office work which constitutes 90 per cent of modern sociological research. This organized research increases the power of the worker involved; he can undertake larger projects and complete them in a shorter time. It also increases the efficiency of the research worker, since few sociologists can claim excellence in all the varied tasks that enter into a project.

On the other hand, organized research has come into conflict with the traditional procedures of awarding academic and scholarly recognition, which are still based on evaluation of contributions submitted by one scholar.

It is plain that sociological research in the United States, precisely because it is organized research, is expensive research; the average sociological project probably costs more than the average project in history, political science or economics. During the past decade the proportion of government support has decreased somewhat, while the proportion of foundation support has increased. The most important agencies have employed prominent sociologists on their staff, and it is the practice among