

by an Austrian botanist and geologist from whose studies much new information is expected:

ONE of the interesting minor results of M. Dybowski's recent journey from the Mobangi to the Shari was the discovery that the natives of that part of the Sudan use chloride of potassium instead of chloride of sodium to season their food. They carefully select plants which on burning yield an ash containing a minimum of carbonates, and extract their "salt" by boiling water, subsequently filtering and evaporating the solution.

DR. A. GLOY has recently published a very interesting discussion of the population of Schleswig-Holstein, tracing its distribution to the character of the land. In order to represent graphically the cause and effect on the same paper, the various agglomerations of people from single cottages to towns of over 2000 inhabitants, are shown by dots of increasing size on a geological map. It thus becomes apparent that the population is arranged so that the fertile fenlands and clay ridges which run from north to south are relatively thickly peopled, while the belt of sandy and barren soil separating them has few houses except along its boundaries. The type of dwelling in rural villages is also found to vary, showing a clear relation to the former extension of the Slav tribes westward before the time of Teutonic predominance.

In a careful study of the political divisions of the earth, Dr. A. Oppel has come to the conclusion that about 1,700,000 square miles are uninhabited or ownerless, about 5,000,000 square miles more without settled government, and the remaining 45,000,000 square miles are occupied by definite states. He recognises seventy-five such states, but most of them are of such insignificant superficial extent that the eighteen largest make up 87 per cent. of the whole area.

FLIES AND DISEASE GERMS.

AS we become more intimately acquainted with the nature of pathogenic micro-organisms, the manner in which their distribution takes place also becomes more intelligible. For several years past, through researches made by Grassi, Cattani, and Tizzoni, it has been known that flies are capable of disseminating cholera bacteria. These authors placed minute quantities of these bacilli on to the bodies of flies and found that after carefully preserving them under a glass shade in diffused daylight for an hour and a half and longer, when introduced into sterile culture media these flies gave rise to typical cholera growths. These results have quite recently been confirmed by Simmonds. Further experiments on the part played by flies in the propagation of disease germs have been made by Celli, who fed flies with the sputum from phthisical patients, also with pure cultivations of the typhoid bacillus, of anthrax, and other organisms. The particular microbes experimented with were afterwards demonstrated in the excreta of these flies, partly by microscopic examination and partly by direct inoculation into animals. The latter method was especially successful in the case of the anthrax and tubercle bacilli. A paper which has just appeared by Sawtschenko in the *Centralblatt für Bakteriologie*, vol. xii. p. 893 ("Die Beziehung der Fliegen zur Verbreitung der Cholera") contains an account of some experiments which the author has made on the fate of cholera bacilli when introduced into flies. The flies used in these investigations were (1) the common small house-fly and (2) a much larger variety, which, from the description given, would seem to answer to our so-called "blue-bottle fly." It was further marked by its rapid flight, its rare occurrence within doors, by feeding on all manner of decaying substances, besides being frequently found on articles of food of all kinds. These flies were placed in shallow dishes containing a few drops of broth infected with cholera bacilli, after which they were removed and fed on raw meat or sterile broth. In some cases the excrements of cholera patients were substituted for the cholera cultures. It would appear very difficult to keep flies alive in captivity, for the healthy as well as those experimented upon died in nearly all cases after twenty-four hours; in only very few instances was it possible to preserve them four days. Not only were the excreta of the flies carefully examined for cholera bacilli, but in

many cases the whole contents of the abdominal cavity were removed with all the proper antiseptic precautions, and inoculated into culture tubes. This latter practice was adopted in order to satisfactorily dispose of all suggestion of the presence of cholera germs in the excreta being due to their accidental contamination from the feet of the flies themselves. In all cases cholera bacilli were found, both in the alimentary tract and in the flies' excreta. Moreover, guinea pigs inoculated with cultivations of cholera microbes obtained from the former died quite as rapidly as when inoculated with ordinary cholera cultures, thus showing that their virulence had not been impaired through residence in the fly's body. In the intestinal tract of those flies fed with cholera excreta, not only were cholera bacilli found, but also other organisms resembling the vibrio Metschnikowi Gamaleia, and which on inoculation into guinea-pigs and pigeons killed them in twenty-four hours. Similar results were obtained when the vibrio was separated out directly from the cholera excreta and inoculated into these animals. Thus in this case also the virulence of the organism had undergone no abatement during its sojourn in the fly's alimentary tract, thus fully confirming similar results with other organisms obtained by Celli. Sometimes enormous numbers of cholera bacilli were found in the alimentary tract of flies after seventy-two hours, in spite of their having been fed after the first infection with nothing but sterile broth, with the object, if possible, of washing out the bacilli. Sawtschenko makes the alarming suggestion that the bacilli may very possibly be able, under suitable conditions of temperature and nourishment, to multiply within the bodies of flies, in which case the latter must not only be regarded as dangerous carriers of infection, but as a hot-bed for the preservation and further multiplication of cholera bacilli.

SCIENTIFIC SERIALS.

American Journal of Science, March. The specific heat of liquid ammonia, by C. Ludeking and J. E. Starr. The liquid ammonia used in the experiments was found to contain 0.3 per cent. of moisture, and on spontaneous evaporation to leave only a trace of residue. The specific heat was measured by Regnault's method, the liquid being enclosed in a steel tube of 16.122 cc. capacity, stoppered by a steel screw. The mean value for the specific heat deduced from two series of experiments was 0.8857. —A short cycle in weather, by James P. Hall. If a diagram is drawn exhibiting the changes of daily mean temperature in New York city for a few months it will be discovered that these fluctuations occur every three or four days, on an average, but that some have much greater amplitude than others. In the course of four weeks, perhaps, there will be only two or three conspicuous rises and falls. Upon further scrutiny there will be observed a tendency in these more prominent features of the curve to repeat themselves at intervals of about 27 days. That these and kindred oscillations in New York city are, in the main, representative of temperature changes over the greater part of the United States becomes evident on comparing temperature curves taken at Utah, St. Paul, St. Louis, and New York respectively. A conspicuous rise of temperature at New York is apt to be a day or two behind that at St. Louis, fully two days behind St. Paul, and sometimes nearly a week behind Utah. Mr. Hall attempts to find a relation between this 27-day period and the sun's rotation, which takes place in about the same time. —Kilauea in August, 1892, by Frank S. Dodge. The chief object of interest on the floor of Kilauea was the lava lake of Halema'uma'u, whose surface was found to measure 12.1 acres, which is much larger than any lake in recent years. The lake is nearly circular in form, its longest diameter being 860 feet, and the shortest 800 feet. The lava was about three feet below the rim on an average. Frequent breaks occurred in the rim, from which large flows took place, in some cases covering several acres of the floor. One large flow on the night of August 25th covered about one-third of the floor, and raised its level from one to four feet. The lake was at times very active, with fountains playing over its surface in every direction, as many as fifteen being counted at one time by a careful observer. Small fountains were always to be seen in some locality, and the whole surface was marked by long irregular seams always in motion. —Also papers by Messrs. Chamberlin, Darton, Upham, and Winslow, and the Address delivered