viewed from the greatest distance possible the effect becomes more attractive, and the lights and shadows of the clouds blend into one another in a more harmonious whole. A very similar effect is produced in the smaller work by the same artist, "Welsh Hills near Barmouth" (602).

When looking at a wide stretch of country, whether it be an extensive plain as seen from the top of a range of hills, or the hills and valleys of a mountainous country viewed from some vantage point, the most attractive effects are often obtained on a day when the sky is covered with detached clouds of the cumulus type, causing a bright contrast between the light and shade on the country below. A scene of this kind is depicted by Bertram Priestman in "The Walls of Langstrothdale" (114), but to the critical observer the whole is spoilt by the unreality of the clouds themselves, though the shadow effect on the ground is more successful. The only type of cloud which is almost uniformly well dealt with is where the "clouds" appear as mountain mists, and one concludes that artists must subject this type to much more study than the clouds in the sky above. Some of these mountain mist effects are notably good. "The Head of the Glen," by Peter Graham (439), and "Yarrow: 'The Vapours Linger Round the Heights,'" by Alfred Parsons (126), may be mentioned amongst others in this connection. In "Easedale Tarn, Westmorland" (207), J. H. Crossland has shown us clouds over a mountain-top which are delightfully real. Attempts to indicate showers passing over a landscape generally lead to a more successful portrayal of the dark falling rain in the shower than of the cumulo-nimbus cloud above. This appears to be a subject that might give far more realistic and attractive results than any shown in this year's exhibition. "The Gravel Pit," by Arthur Friedenson (583), seems to be the most successful of those exhibited. The high cloud at sunset in B. W. Leader's "Still Evening" (175) raises an interesting speculation as to the probability of the conditions shown being true to life. Bands of high cloud are brightly tinted pink in the rays of the setting sun, whereas other clouds in the same part of the sky, but at an apparently higher level, are illuminated, but without colour. The writer does not remember a case of this kind coming under his observation, although it appears not to be impossible. The interesting and quite common case where the high clouds are illuminated with a pink glow, while the lower ones have already passed into the shadow of the earth, does not seem to have attracted the artist's imagination. Very interesting information as to the relative heights of different cloud layers may sometimes be obtained in these circumstances.

Observers often, in dealing with Nature herself, have difficulty in deciding to which of the artificial types of the international classification a cloud belongs, so infinite are the varieties which occur, but all meteorological observers who visit the Academy will undoubtedly give a sigh of relief that they are not expected to classify the strange shapes which appear in the sky in "Evening" (233), to mention one case only, though it does not stand alone. In "Wind from the South" (383) the artist presumably set out to portray falling snow; but surely with a title so meteorological he might have given more careful attention to the meteorological elements in his picture. Finally, all who hold that gunfire has an influence on rainfall should undoubtedly visit the Academy for confirmation of their views. If the clouds over the battlefields of France really take the forms shown in some of the pictures (notably "Dawn," 333), few will have the hardihood to maintain that the rainfall or even the entire climatic conditions of the neighbourhood may not be seriously affected.

J. S. D.

THE CARNEGIE TRUST FOR THE UNIVERSITIES OF SCOTLAND.

A FEW months ago (NATURE, January 10, p. 369) attention was directed to a report of a special committee appointed by the British Science Guild and published in the journal of the Guild for December last. The report discussed the manner in which the trustees of the Carnegie Trust for the Universities of Scotland were carrying out their purpose of strengthening and developing scientific research, a question which was raised by Prof. Soddy in *Science Progress* for January, 1917. The recent issue of the sixteenth annual report of the Carnegie Trust seems to call for some further comment in connection with the criticisms then advanced.

The report shows how the grants have been distributed during the year 1916–17. Since this is the fourth year of the third quinquennial period, no vital changes in the general character of the report are to be expected. A new feature is the list of the trustees and the members of the executive committee, which is printed on the back of the title-page. When it is borne in mind that one of the main purposes of the Carnegie Trust is to improve and extend the opportunities for scientific study and research, it is matter for some surprise that of the twenty trustees four only can be regarded as men of science with direct knowledge of the meaning and methods of research. There is improvement, however; for originally there were only two, and for a short interval none, who could be ranked as men of science.

As regards distribution of grants under Clause A of the trust deed, the present war conditions have naturally had important effects. Large sums granted towards the cost of new buildings have not been expended. In the case of the Universities of Glasgow and Aberdeen these sums are simply held over; but in the case of Edinburgh a sum of 31,000*l.*, originally allocated over the five years for buildings and permanent equipment in chemistry and anatomy, has been diverted for the endowment of a professorship of chemistry in relation to medicine, a professorship of French, and two new

lectureships, one in Italian and one in Spanish. The institution of a separate chair for chemistry in medicine may be expected to make possible a fuller development of the original chair as a centre of scientific research, and the University of Edinburgh is to be congratulated on having given a useful lead in this much-needed reorganisation of the chemistry department.

Arranging under general groups the sums expended during the year 1916–17, and taking into account the change in the allocation for the University of Edinburgh, we find that 43 per cent. was applied towards providing new buildings and permanent equipment in arts, medicine, and science, 36 per cent. towards endowment of professorships and lectureships in these three faculties and for other general purposes, 9 per cent. towards books, etc., for libraries, and 12 per cent. towards the direct endowment of research in science, medicine, and history—where under history are included also archæology, economics, modern languages, and literature. It may be mentioned that fully half the sum was allocated to the history group, so that only 6 per cent. of the grants for the year were used in the encouragement of research in modern progressive science.

It must be recognised that under present war conditions scientific research by young graduates is practically impossible; but the fact remains that in the present quinquennial scheme, which was inaugurated nine months before the outbreak of war, direct endowment of scientific research did not form a very conspicuous feature. On the other hand, it may be argued that it is not an easy matter to supply money directly for research unless the purpose of the research is clearly recognised. Post-graduate work by Carnegie scholars and fellows may or may not yield important gains in increasing or systematising scientific knowledge. A trust like the Carnegie Trust for the Universities of Scotland may have good reasons for believing that the interests of scientific research may be best advanced in the meantime by providing better laboratories, increased equipment, and more efficient teaching, in the hope that other good things will follow in their train. In any case the trust has a grave responsibility, and must see to it that there is no chance of wasteful squandering of the funds it has to administer.

THE RELATIONS OF GEODESY TO GEOLOGY.[1]

THE study of the earth is the aim of both geologists and geodesists, but their methods of investigation differ so widely that their co-operation is sometimes difficult to bring about. While the geologist utilises descriptions and measurements which he has collected at many places widely distributed over the earth's surface, the geodesist deals with a comparatively limited number of observations carried out with the aid of instruments of high precision, and carefully corrected for all ascertainable errors; his material for discussion is provided from data the magnitudes of which are very small, and the weight and relevance of which are not readily appreciated by workers whose advance is along other lines. Still, the co-operation of geology and geodesy is very desirable, and the work that has been done during the past ten or fifteen years in India, where the most extensive collection of high-grade geodetic material in the Empire is available, in bringing together these two lines of investigation may lead, we hope, to further work both there and elsewhere. The reports of the Geodetic Survey of South Africa furnished some similar material, and Dr. W. Bahn, in an article which appeared in the *Beiträge für Geophysik* of 1910, discussed the geodetic results and indicated their bearing on the tectonic geology of the area; but such discussions have been few.

The Himalaya problem is dealt with in the present memoir by Mr. Oldham, who aims at adding to the stock of fundamental facts and so utilising the work of Col. Sir Sidney Burrard, Dr. Hayden, and others that a theory may be built up such as will adequately account for the conditions revealed by geodetic and geological observations.

The following conclusions are quoted as obtaining general acceptance, and as, therefore, providing a starting point for discussion. The elevation of the Himalayas has been accompanied by compression of the rocks of which they are composed; a great main boundary fault lies along the outer edge of the Himalayas, and separates the rocks of the northern area from the Upper Tertiary rocks of the southern area; a series of similar faults is found within the Siwalik area, and these are regarded as marking progressive shifts southwards of the boundary of uplift to the north and deposition to the south.

The discussion is introduced by a chapter which is devoted to an explanation of the nature of the geodetic evidence in which the theories of compensation and isostasy are discussed. A short but useful account of compensation from the work of Archdeacon Pratt and Sir George Airy to the recent studies of Hayford, Bowie, and others leads up to the development of tables of compensation factors for various distances and depths.

The geodesist does not determine the absolute value of the deflection of the plumb-line from the vertical, and selects a station as origin to which he refers the results obtained at other stations. For India the station of Kalianpur has been taken as origin with the assumption that no deflection exists there; but as the existence of a southerly deflection has been established, a correction for the amount of it has to be applied generally before the results at other stations can be employed. Variations in the force of gravity are determined by comparing the period of a free-swinging pendulum at different stations when all the necessary corrections have been applied. These local values have then to be compared with the normal value for that point on the earth's surface, and to do

[1] "The Structure of the Himalayas and of the Gangetic Plain as Elucidated by Geodetic Observations in India." By R. D. Oldham. "Memoirs Geol. Survey of India," vol. xlii., part 2, 1917.