been just as apparent during the latter condition of the atmosphere as during the former. Hasn't the Krakatoa dust all settled down yet?"

Another observer (p. 322) bears witness to this 'continued and oftentimes peculiarly bad definition;' and Mr. W. S. Franks, in writing to the same journal (p. 416), attributes it 'to the unusually dry season.' Perhaps those who are working upon the subject of the 'Krakatoa dust' can give some explanation of this exasperatingly persistent *bad seeing*. For months past it has been noticed here by all who have had occasion to observe in the daytime, and, indeed, I noticed it myself in the autumn of 1883; but I was not particularly struck with it at the time, as at certain seasons of the year we are in the habit of expecting a smoky atmosphere and poor definition, on account of forest-fires or other causes. As the bad seeing has continued even down to the present date, we cannot account for it in this way.

The haziness is usually confined to the south of our zenith (I am speaking more especially of meridian observations), and is most marked in the neighborhood of the sun. The sky is white, though this whiteness is sometimes barely perceptible, and the stars are unsteady. Stars of the third or fourth magnitude, which have frequently been seen on a good observing day in other years, it is almost useless to try for now. That the phenomenon is not local seems evident from the remarks of the English observers quoted above; but has it been noticed by others in widely different latitudes?

WILLIAM C. WINLOCK.

Washington, D.C., July 22.

AN IDEAL UNIVERSITY FROM AN ENGLISH POINT OF VIEW.

AN article in a recent number of the *Contemporary review*, by James Bryce, on 'An ideal university,' is well deserving the attention of Americans, all the more because its author is an Englishman, writing with immediate reference to the wants of the city of London. He has, however, by repeated visits to this country, become familiar with what we are doing, and he possesses that truly philosophic mind which is quite as ready to gather suggestions from the experiments of a new state of society as from old-world experience. An active member of Parliament, a professor of Roman law in the university of Oxford, the writer of an historical work of remarkable power, accustomed in his wide range of travels to observe th discrimination the influences of different religions, laws, and educational systems upon the life of the people, he combines in an exceptional way the wisdom of a scholar with that of the man of affairs. His plea is for an organization in the city of London which shall be a true university, not a corporation holding examinations and conferring degrees, like the actual university of London, not a fellowship of colleges, not a group of museums and libraries; for all these are in existence. His plea is for something different from, if not higher and better than, any or all these agencies: it is a plea for that higher and better organization which thoughtful Americans in all parts of this country are trying to develop.

'What is an ideal university?' asks Mr. Bryce. The answer which he gives has in it nothing of novelty, nothing of eccentricity, nothing beyond the reach of a wealthy community. It is the answer of common sense, directed by experience, to the solution of a very important problem. It is the answer which has often been given before, but rarely in such persuasive and intelligible phraseology. Assuming that a university is a body of men engaged in teaching the highest knowledge, and is therefore something very different from Carlyle's 'true university, a collection of books,' he claims that breadth is the first essential,— catholicity, universality. He would have it include not only the subjects which are traditional (languages, mathematics, and theology), but the social sciences (politics and comparative jurisprudence), the sciences of observation and experiment, and even the applied sciences. In this last suggestion he is broader than most Germans, for they have hitherto inclined to teach the applied sciences away from the universities, in polytechnic and *real* schools. Americans have often, though not always, inclined to follow this German precedent; and those who hold the opposite view will be fortified in it by this word of Mr. Bryce.

The next essential of the ideal university is freedom. The writer plants himself firmly, and without reservations, on the doctrine that any one who comes may study any subject he pleases, whether or no he studies any other subject, or enters for a regular course. He would let the university prescribe its course or courses, and give its honors and degrees in accordance with such restrictions. "Place

guard, if you like," he says, "at the doors of your examinations; but let your lecture-rooms stand always open, like the churches of Catholic Europe, so that thereby even the passing wayfarer may hear the voice and be drawn in." With the main intent of this remark, most of our colleges agree, opening their halls to special students; but it may be as well to make a note of caution on the margin of what we read, lest the impression should be given that 'happening in' to an occasional lecture makes the scholar. The regular and persistent attention to a serious subject is the first element of success in university-work. The group of occasional attendants or special students in our colleges, according to our experience, includes a few of the very best, and some of the very worst, who ever enter the academic walls.

The third essential of the ideal university, according to Mr. Bryce, is that it should teach. This pointed remark is obviously directed to the idea, which has been more developed in England than anywhere else, that the chief function of the university is to examine students, and confer degrees. This is the avowed end of the university of London and of the Royal university in Ireland. In years gone by, even the universities of Oxford and Cambridge left the principal work of instruction to the colleges, reserving the prerogatives of holding examination and bestowing degrees.

These three elements — breadth, freedom, and teaching-force — are the essentials of a university. Supplementary powers are the bestowal of honors (if it is thought worth while to maintain the system of academic rewards), the prosecution of research (which will take care of itself, if teachers of real ability are secured), and, finally, the acquisition of endowments (on which Mr. Bryce lays but little stress).

On the subject of endowments, Mr. Bryce writes like one who has seen the evil which comes from the long perpetuity of individual whims; and he boldly declares that the principle should once for all be laid down, that charitable endowments belong, not to the dead, but to the living, and that each generation shall be free to use them for such objects as it finds most presently beneficial. These considerations ought to be weighed and discussed in the United States, where every year new and generous endowments are made for charity and education. One enlightened giver, whose name we could mention, having had his attention called to this point, expressly provided that the million which he gave, might, after a certain period, be applied by his trustees to a purpose akin to the original object, but not identical with it, if in their judgment such a course would be wise. The difficulties experienced at Andover and at Exeter in the management of the Phillips funds are examples of the celerity with which conditions become fetters.

Bryce's main doctrine is, that the ideal university must 'give first-rate teaching.' This, undoubtedly, is the true doctrine. But how are first-rate teachers to be developed or discovered, and how are they to be kept 'first-rate' under all the counteracting influences to which they are exposed? There's the rub. On these points we should like to hear further from Mr. Bryce. Shall only men of genius be chosen professors? There are not men of genius enough to go round. Shall practical instructors, those who are well versed in didactic methods, be preferred? The faculty which is filled up with such men will be governed by routine; it will have neither *éclat* nor inspiration: it will be like a military school, — a place for training, not a place for the development of great minds. But suppose first-rate teachers are secured, men who have some genius and some common sense, how are they to be kept 'first-rate'? We reply, The university is responsible for its treatment of its professors. They must be kept at work, in actual instruction, or they will grow indolent and sterile; they must have considerable leisure, or they will not think and write and investigate, but will simply be repeaters of old stories; they must have ample supplies of books, journals, instruments, for these are the diet on which they grow; they must have stimulants, the best of all being the attention of bright and

growing scholars around them, the next being a consciousness that they are responsible for what they do to the world of science and letters, and not merely to their own colleagues and followers; and, finally, they must not only be fairly paid, but must be protected from temptations to every form of extravagance in the employment of their resources. Such are some of the difficulties which are to be encountered when the simple idea of 'first-rate teaching' is expanded.

All that Mr. Bryce says about the end of an education is excellent: "It is not to train students merely as lawyers, physicians, clergymen, engineers, bankers, merchants, and statesmen, but as men; and the best thing the university can do for them is to form in them what we will call the philosophic mind."

THUNDER-STORMS.

BENJAMIN FRANKLIN once remarked, in substance, sadly to a friend, "It is now eight years since I showed that mankind could be protected from the danger of lightning by lightning-rods; yet there is hardly a house in Philadelphia provided with them." The heart of the great American philosopher would be greatly warmed if he could perceive the activity of his disciples, who waylay every builder of a house, and awaken fears where all was peace before. There is no question oftener asked of the professor of physics than this: "Shall I put lightning-rods on my house, and, if I erect them, what should be their form and position?" Personally I have given the following abbreviated answers. "If your house is surrounded by tall trees, or if there are higher houses in your immediate neighborhood, I should trust to the trees, or kindly leave the expense of the lightning-rods to your neighbor. If your house stands alone, a prominent point in the landscape, on a cliff, or remote from trees, I should be in favor of a properly placed lightning-rod. I should place two or three pointed rods three or four feet above the highest point of the house; allow the metallic rod, which should be at least one-half a square inch in section, to rest, without glass insulators, upon the house; connect all the tin sheathing, the copper gutters, the gas and water pipes, with this lightning-rod; and conduct the latter, by the shortest course possible, to *wet earth*."

These answers seldom conclude the correspondence, however, although one generally prefers to leave to the neighbor the expense of erecting lightning-rods. One brings instances of houses having been struck which are situated lower than one's neighbors, and are surrounded with tall trees which over-topped the houses; and one asks with a shudder, "Can I connect my gas-pipes with a lightning-rod?" Indeed, the writer or would-be authority on lightning-rods has not an easy life before him. He must not only satisfy the timid heart of the believer in him, but he must also fight with all his knowledge the brazen limb of ignorance and superstition, who starts with the postulate that no scientific man knows any thing concerning thunder and lightning, and that the true knowledge has been revealed only to himself while working in a cornfield. It is not long since, that an American professor of physics was sued for twenty or thirty thousand dollars damages for maintaining that the members of a lightning-rod company which placed lightning-rods like a letter U upon the roofs of houses were practically quacks; the theory of this lightning-rod being, that the lightning, if it struck one point of the U, would be dissipated into the air from the other point. There is a lightning-rod company in Massachusetts at the present time which erects lightning-rods on the theory that lightning always seeks electrical earth-currents; and, if there are earth-currents beneath a house, that house should be protected, and the rods led into the path of the earth-current. If, on the other hand, no earth-currents run near the house, such a house is safe, and needs no lightning-rods. The electrician of this firm is self-taught: there are no books on electricity in his library. He discovers the earth-currents by a forked stick. Not deterred by the fact that there is no evidence to prove that a discharge takes place between a charged cloud and a current of electricity in the ground, and, moreover, no evidence to prove that earth-currents move in regular paths through the earth, and, indeed, no *conclusive* evidence of the existence of earth-currents, he persuades even the so-called practical electrician to rearrange the lightning-rods on his house.

The student of electricity is therefore called upon to assert the grounds of his belief: and he finds it difficult to convince his audience; for they are, in general, not sufficiently conversant with electrical phenomena to appreciate his arguments. The position taken by most professors of physics on the subject of lightning-rods is based upon the experiments of Franklin, in which he showed that pointed metallic rods,