tion in each particular case. As employed by Malays, who are followed both by Dutch and English travellers, the word has scarcely better standing-ground in a scientific terminology than has "Alfuro."

The following fact with regard to the Sea-Dyaks may be of interest. When Europeans first entered Sarawak the Kayans, properly so called, were dominant in the great Rejang River, and the Sea-Dyaks were strictly confined to the Batang Lupar, Saribas, and Kalakah rivers. Now the Sea-Dyak population of the Rejang is some 30,000, and the Rejang Dyaks are rapidly occupying the Oyah, Mukah, and Tatau rivers further up coast. On the original Sea-Dyak rivers the people always use the expression "we Dyaks" when they mention their own race; but on the Rejang the expression "we Iban" will invariably be heard—the explanation being that the Kayans habitually designate Sea-Dyaks as "Ivan" among themselves, whence the Dyaks have applied the name; but having no v-sound in their language, they say "Iban." The Kayan proper is rich in v-sounds. I have been informed, though I cannot vouch for the accuracy of the statement, that "Ivan" in Kayan is a term carrying with it a sense of opprobrium. However this may be, it is remarkable that so large a section of the Sea-Dyaks, who are so thoroughly dominant in Rejang, and are in constant daily communication with their original seat in the rivers to the westward, should in the course of some thirty years have come to habitually speak of themselves by the name given them by their foes. And it is the more surprising because the Sea-Dyaks generally give new names of their own to the geographical features of the district into which they immigrate.

Papar, North Borneo A. HART EVERETT

Seeing by Electricity

WE hear that a sealed account of an invention for seeing by telegraphy has been deposited by the inventor of the telephone. Whilst we are still quite in ignorance of the nature of this invention, it may be well to intimate that complete means for seeing by telegraphy have been known for some time by scientific men. The following plan has often been discussed by us with our friends, and, no doubt, has suggested itself to others acquainted with the physical discoveries of the last four years. It has not been carried out because of its elaborate nature, and on account of its expensive character, nor should we recommend its being carried out in this form. But if the new American invention, to which reference has been made, should turn out to be some plan of this kind, then this letter may do good in preventing monopoly in an invention which really is the joint property of Willoughby Smith, Sabine, and other scientific men, rather than of a particular man who has had sufficient money and leisure to carry out the idea. The plan, which was suggested to us some three years ago more immediately by a picture in *Punch*, and governed by Willoughby Smith's experiments, was this:—Our transmitter at A consisted of a large surface made up of very small separate squares of selenium. One end of each piece was connected by an insulated wire with the distant place, B, and the other end of each piece connected with the ground, in accordance with the plan commonly employed with telegraph instruments. The object whose image was to be sent by telegraph was illuminated very strongly, and, by means of a lens, a very large image thrown on the surface of the transmitter. Now it is well known that if each little piece of selenium forms part of a circuit in which there is a constant electromotive force, say of a Voltaic battery, the current passing through each piece will depend on its illumination. Hence the strength of electric current in each telegraph line would depend on the illumination of its extremity. Our *receiver* at the distant place, B, was, in our original plan, a collection of magnetic needles, the position of each of which (as in the ordinary needle telegraph) was controlled by the electric current passing through the particular telegraph wire with which it was connected. Each magnet, by its movement, closed or opened an aperture through which light passed to illuminate the back of a small square of frosted glass. There were, of course, as many of these illuminated squares at B as of selenium squares at A, and it is quite evident that since the illumination of each square depends on the strength of the current in its circuit, and this current depends on the illumination of the selenium at the other end of the wire, the image of a distant object would in this way be transmitted as a mosaic by electricity.

A more promising arrangement, suggested by Prof. Kerr's experiments, consisted in having each little square at B made of silvered soft iron, and forming the end of the core round which the corresponding current passed. The surface formed by these squares at B was to be illuminated by a great beam of light polarised by reflection from glass, and received again by an analyser. It is evident that, since the intensity of the analysed light depends on the rotation of the plane of polarisation by each little square of iron, and since this depends on the strength of the current, and that again on the illumination of the selenium, we have another method of receiving at B the illumination of the little square at A. It is probable that Prof. Graham Bell's description may relate to some plan of a much simpler kind than either of ours; but in any case it is well to show that the discovery of the light effect on selenium carries with it the principle of a plan for seeing by electricity. JOHN PERRY

Scientific Club, April 21 W. E. AYRTON

Musical Sounds within the Ear

I SHOULD like to know how far the musical sounds, which we sometimes hear within our ears, are of different pitch in different persons. From repeated observations I find that my left ear gives G, and the right one B. A friend of mine, who is a good performer on the violin, finds F and A respectively.

It is perhaps not without interest that in some parts of Germany (at least in Silesia) people believe these sounds to be indicative of one's being talked about, and that the sound ceases as soon as one thinks of the person who is supposed to do so.

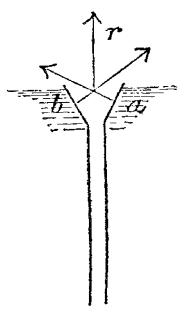
Caráca, March 18 A. ERNST

Ice Filaments

"THE comb-shaped masses of ice of fibrous structure" mentioned by your correspondent, in explanation of the inquiry made by the Duke of Argyll, are observed every winter in the southern portion of the United States, especially on the sloping sides of a path or country road where the surface-earth has been removed, and the natural clay sub-soil is not rendered compact by being trodden. The conditions requisite for its abundant production are a sudden reduction of temperature below the freezing-point when the clay soil is thoroughly saturated with water. When this occurs at sunset, the next morning, if the night continues favourable, will disclose a vast collection of fibrous filaments, from two to six inches in height, rising from the soil in close juxtaposition, generally holding aloft in their caps portions of the soil, the longest crystals appearing when the soil is free from surface-loam.

I have frequently given to my class this explanation of the phenomena.

The capillary tubes of the soil are all filled up to the surface with water. The sudden reduction of temperature freezes the water at the *surface*, but does not chill it within the soil below 32° F. The consequence is that this expansion, caused by congelation at the upper extremity of the capillary tube, compresses the walls of the tube externally, and causes the mouth of the tube at the surface to assume a conical shape, as in diagram. The congelation of all the water within the conical cavity causes pressure normal to the surface of the cone at *a* and *b*, and hence produces a vertical resultant, *r*, that raises the cone of ice. Capillary action immediately fills the little cavity with water, which in turn is frozen and elevated by the expansion force of its congelation. The filament thus grows in this simple way from its base. The soil in which these fibrous crys als or filaments form is never frozen; thus proving the correctness of the explanation.



They are formed very rapidly. I have on more than one occasion, when a sudden chill at sunset would start them growing, listened to the crackling of the little ice-crystals as they would break loose from each other, being pushed up by this expansive force.

I infer the filaments of ice formed on rotten wood are due to a similar cause, and that they will not be formed unless the reduction of temperature is quite sudden. That is, if the reduction of temperature is so gradual that the water somewhat below the surface in the cylindrical portion of the capillary tube is frozen, the crystals will not be elevated, but the ground will be frozen. WM. LEROY BROUN

Vanderbill University, U.S.