hunter's pity. Thus Carstensen in his 'Two Summers in Greenland' gives an instance of an Eskimo hunter who was so affected by the sad appealing eyes of the seals as he was about to despatch them that he was unable to shoot, and was obliged to give up hunting to the detriment of his own family. Monkeys and giraffes often escape human hunters through the pity their actions inspire when driven to extremity, as all readers of sporting books will recall. Hough reports that even the bear when cornered and completely at the mercy of the hunter sometimes exhibits a pitiful submission and despair.

A third point which deserves more consideration is whether, as the authors represent, the literature of pathos is preferred by mankind in general to that of joy (p. 581). Certainly humorous and comic papers abound, and most news sheets and general periodicals have a section devoted to wit and humor, whereas there are no journals or portions thereof devoted to pathos. Most novel readers prefer, I think, the tale where everything turns out right in the end. The vast vogue of farce and burlesque on the stage is another evidence of popular taste. With the modern development of humor especially with the Anglo-Saxon races, much annoyance and suffering that would once have been pitiable in ourselves and others, is merely laughable. On the whole the present tendency seems to be to restrict the field of pity and to intensify and rationalize it in that field.

The pleasure of pity is little referred to, but the survival theory is mentioned: "It seems as though our race had developed modern civilization in which the leisure field is so vastly widened and the pain field so greatly reduced, too suddenly, and that our nervous system is not yet wonted to so much ease and luxury and had therefore to hark back to play over the old litany of sorrow and pain in the falsetto way of the stage novel and poem." But certainly the primary and main pleasure in pity is that it emphasizes power of protector over protégé, and the secondary source is in seeing the desired relief effected. Pity which is in no wise objective and effective, but solely subjective indulgence—*e. g.*, pleasure in the tragic poem—is like other emotion for its own sake, an art sphere, a late severance of emotion and action, and so while resting upon the past is not to be described as survival, but as the progressive development of experience for its own sake. Thus literature and music idealize pity into pure and subtle forms, and the soul, dissolved in infinite, delicious sadness, experiences the most evanescent and distant development of maternity-paternity.

Hiram M. Stanley.

Lake Forest, Ill., Sept. 10, 1900.

THE KIEFFER PEAR AND THE SAN JOSÉ SCALE.

In his New Jersey Report for 1897 (p. 484), Dr. J. B. Smith writes: "A curious fact was emphasized this year; in an orchard of Kieffer trees, when once it becomes infested [with San José scale], the scales flourish as well as anywhere, and the trees become as completely incrusted as any other variety. But where Kieffer is mixed with other varieties it remains almost exempt, even where neighboring trees are badly infested. This was noticed several times, and Le Conte seems almost less troubled than Kieffer."

In the Yearbook of the Department of Agriculture for 1897 (p. 415), Messrs. Swingle and Webber write: "The Kieffer and Le Conte pears * * * are almost certainly hybrids between the Chinese sand pear (*Pyrus sinensis*) and the common European pear (*P. communis*), since both were grown from seeds of the sand pear obtained from trees which were surrounded by various European pears." On the same page they write of "the problem which the French hybridizers have successfully solved in obtaining hybrid grapes combining the resistance to Phylloxera of the American grape and the quality and size of the fruit of the European grape."

I have elsewhere set forth my reasons for believing that the San José scale is a native of eastern Asia, and, if this is the case, does it not appear that our hybridizers have unwittingly obtained a pear combining resistance to the San José scale with the good qualities of the European pears, the fruit of the Chinese sand pear being very poor? The facts, at all events, are strongly suggestive of such a thing,

and point, perhaps, to the original food-plant of the San José scale.

T. D. A. COCKERELL.

NOTES ON PHYSICS.

ARCHITECTURAL ACOUSTICS.

ABOUT five years ago Professor W. C. Sabine was directed by the Corporation of Harvard University to propose means for remedying the acoustical defects of the lecture room of the Fogg Art Museum at Cambridge. About two years were spent in experimenting on this room and permanent changes were then made.

The experimental work done in connection with this lecture room has led Professor Sabine to take up seriously the general question of architectural acoustics and we are promised a series of papers on this subject the first of which, on reverberation, is published in a recent number of the *American Architect*.

In an introductory chapter Professor Sabine gives a clear and comprehensive statement as to the different ways in which sound is affected by being confined in an audience room, substantially as follows:

The *loudness* of the sound is as a rule greater at a given distance from the speaker than it is in the open air.

The *character* or *timbre* of a complex sound is more or less altered by re-enforcement of certain of its elementary tones by resonance, or by the re-enforcement or weakening of some of its elementary tones at certain parts of the room by interference. This alteration of the character or timbre of a complex sound Professor Sabine calls *ditortiosn*.

The sound *persists* in a room for a considerable time after the sounding body ceases to vibrate. This is due to the more or less complete reflection and re-reflection of the sound from the walls, floor and ceiling. This persistence of sound in a room Professor Sabine calls *reverberation*. It causes the successive sounds in articulate speech to overlap and become confused. Especially the sonorous vowel sounds persist, and obscure the delicate and fleeting variety of the consonant sounds.

The question of loudness becomes a serious matter only in very large audience rooms.

Sound distortion and reverberation depend very largely upon the same conditions. Thus the extent to which an air column will enforce the tone of a tuning fork depends largely upon the length of time the air column will continue to vibrate when left to itself after having been set vibrating. Sound distortion is not so serious a matter as reverberation and, since the two depend largely upon the same conditions, it seems that reverberation only need be considered in any practical case.

The reverberation of a room, measured by the duration of a sound after the sounding body ceases to vibrate, depends upon the absorbing power of the walls and of other reflecting surfaces and upon the size of the room. Thus heavily draped walls or walls lined with thick felt absorb much and reflect little of the sound which strikes them, and a sound persists but a short time in a room of which a considerable portion of walls are padded or draped. An audience also absorbs a large portion of a sound in a room and greatly reduces reverberation. A larger room has greater reverberation than a small room, walls being of similar material, because the sound has farther to travel between succeeding reflections, and a greater time is therefore required for the absorption of a given portion of the sound.

Professor Sabine found that the note of a particular organ pipe remained distinctly audible in the lecture-room of the Fogg Art Museum for 5.6 seconds after the blowing of the pipe ceased. The method proposed and carried out for the reduction of reverberation was to line a considerable portion of the walls of the room with a thick hair felt.

Professor Sabine has determined, by a very ingenious method, the absorbing power of a variety of wall surfaces, such as brick, plaster on brick, plaster on lath, glass and boards, and he has shown that the reverberation of a room can be pre-determined by calculation in terms of the size of the room and the character of its walls.

W. S. F.

NOTES ON INORGANIC CHEMISTRY.

A VERY considerable amount of work is being done at the present time in filling up the many gaps that exist in descriptive inorganic chem-